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THE ECONOMIC JOURNAL

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THE ECONOMIC JOURNAL

DECEMBER 1955

THE TEACHING OF ECONOMICS IN SCHOOLS AND UNIVERSITIES[1]

I

LADIES and Gentlemen, I do not think that the subject which I have chosen for this presidential address is a subject to which any of us would do well to devote very much attention. Our first business as economists is to study economics; our first business as teachers is to teach it. Given the brevity of human life and the multiplicity of worth-while things to do, any lengthy sacrifice of time to the discussion of mere organisation and method is probably ill-spent: it may indeed become a vicious habit. "He who can does; he who cannot, teaches." The Shavian aphorism is presumably capable of application to teaching itself; and although, like most pronouncements from that quarter, it needs to be taken with a very large pinch of salt, it does indicate a real danger.

Nevertheless, having recognised that the danger exists, I think that we must recognise, too, that there is also a problem. Both in schools and in universities in this country, economics is now studied on a very wide scale. Large numbers of students take final degrees in economics. Large sums of public money are involved. There is, therefore, something to be said for asking from time to time whether all this is on a sound basis, whether the objectives are well-conceived, and the means adopted well-adapted. And in a period of rapid growth, such as we have experienced since the war, perhaps such an inquiry is all the more incumbent. Are the arrangements, which have served us well in the past with a smaller educational population, equally likely to serve us well now that that population has so greatly increased? Or do we need some change?

These, at any rate, are the questions which I want to put this evening. I shall first say a few words about the position in schools. Then I shall go on to a general appraisal of honours degrees in the post-war situation. This will be followed by observations on economics teaching, first for a general and then for an honours degree. Finally, I shall have something to say about the appropriate length of course. All this will be very informal. I shall be thinking aloud about the problems which worry me most as a teacher. I make no pretension to present a systematic survey.

[1] Presidential Address delivered to the Royal Economic Society on July 7, 1955.

II

I turn first, then, to the teaching of economics in schools. This is not a subject on which I can claim to speak with direct experience. I have never taught economics in a school. But, for many years, in one way or another I have been mixed up with the business of examining the results of such teaching, and I have spent many anxious hours meditating on the responsibilities of the Board of Studies in Economics in the University of London for the syllabuses prescribed for school examinations in this subject.

Ladies and Gentlemen, I should be lacking in candour if I did not admit to you at once that my inmost feeling on this matter is one of regret. Fight against it as I may, I cannot resist the wish that the whole business of teaching economics in schools had never begun. I say this with great reluctance; for I know that in doing so I shall give pain to many devoted teachers—some of them my own pupils—for whom and for whose labours I have nothing but admiration and respect. But, in the last analysis, it is principles which are involved, not persons: and we get nowhere if we are diplomatic about principles.

My reasons for this attitude are twofold. First, I cannot get away from the feeling that economics is essentially a subject for grown-ups—at any rate if it is taught as anything like a theoretical system. No simple proposition in economics is likely to be true, unless it is understood as being subject to a whole complex of assumptions not likely to be read into it, save by those who have a sufficient knowledge both of the system of propositions as a whole and of the world of reality to which they have reference. Is it sensible to expect children to possess such knowledge? And if they do not, do we not run the risk of inculcating bad intellectual habits by trying to teach an economics so simplified as to be suitable for their understanding?

Now it may be that there are ways round this difficulty—I shall be saying something about that in a minute. But I do not think that anyone who has given even the most cursory inspection to examination scripts in economics written by schoolchildren can deny that the risk is very real. There are, of course, exceptions: good teachers can make almost any subject worth while, and there are many good teachers in this field. But, in the main, I venture to say that the impression which must be produced on any unbiased mind must be one of considerable disquiet. I do not say that it is impossible to mark properly—that it is impossible to distinguish good answers from bad and the results of good teaching from the results of bad teaching. But I do say that, in the majority of cases, you get a greater sense of immaturity of touch, of unreality of contents than you are likely to get in any of the more straightforward school subjects. I cannot believe that if you are marking papers in chemistry or physics, in languages or geography, you ever have to tolerate such insufficiency as you have to tolerate here. But—and this is my main trouble—this seems to be inherent in the nature of things. In teaching physics or languages you can begin with the simple things and leave the more difficult until later on. But in economics

at this stage you have to water down difficult things in order to make any beginning at all.

These considerations are reinforced if we think of the text-books which are written for studies at this level. Again, please do not misunderstand me. I do not say that there are no good books of this kind, quite the contrary; I can think of some which are of outstanding quality. But if it is asked wherein their goodness consists, does not the answer usually tend to run in terms of the skill with which their authors have side-tracked difficult points and formulated their generalisations without begging awkward questions? The *tour de force* consists not so much in what is said, as in what is not said. Now while this may make very good reading for the sophisticated and perhaps harmless reading of the unsophisticated, is it really the right basis for the teaching of children in schools?

This leads me to my second ground for regret. Even if I were more confident than I am of the intrinsic suitability of general economics as a subject for schoolchildren I should still feel that there were many other subjects which were more suitable and whose claims were more urgent. I can perhaps best put my point in the form of a question to fellow teachers in university faculties. Supposing that we had to choose between candidates having a good training in the basic school subjects but no economics, and candidates having some economics but a less satisfactory grasp of the basic subjects, which would we rather have? Surely there can be no doubt about the answer. We know that we can teach economics from the beginnings at the university stage. But we can seldom make good deficiencies in basic training.

It may be argued, however, that the two things are not incompatible, that the dilemma is unreal, that we can have students who are at once properly trained in the basic subjects and who have also broken the ice of economic studies at school. Well, I have no desire to be dogmatic; and I have certainly no desire to suggest that such conjunctions do not sometimes occur. But it must be said that there are quite substantial grounds for doubting the excellence of the basic training nowadays. Perhaps we are more unfortunate than we used to be in faculties of economics; perhaps we attract a larger proportion of weaker students—a larger proportion who have come just to escape Latin and Mathematics. But it is certainly a fact that in respect of ability to write clear English and to follow simple algebraic and geometrical demonstrations there has been a distinct falling off since the war. I do not think this is a case of the middle-aged professor seeing the past in a roseate hue; the loudest complaints come from younger teachers. I would not argue that this is actually due to the teaching of economics in schools; there are obviously many more important influences at work. I would argue, however, that until it has been put right there is a strong argument against the extension of the curriculum to border-line subjects. I would argue too that the tendency which is so obvious in present educational practice at the school level to multiply the so-called "interesting" subjects may have very unfortunate consequences.

But I do not wish to be wholly negative. Whatever may be our private sentiments in this connection, the teaching of economics in schools is not likely to be abolished or even substantially curtailed. Here we are, faced with a going concern; and the practical problem is not whether it should be liquidated, but rather whether it cannot be improved. Are there not ways of introducing schoolchildren to the study of economic questions less liable to the risks I have indicated?

I think that there may be. I see no way out so long as it is thought necessary to teach economic theory of the more formal sort. But if this could be frankly abandoned and the economic instruction confined to a more or less descriptive explanation of everyday events and institutions, with a certain amount of relevant history thrown in, I can believe that many of the objections I have set forth would largely cease to apply. I should still privately believe that the time could be better spent strengthening the foundations of the hard basic subjects. But as an introduction to citizenship and as a general broadening of the mind, a series of hours devoted to teaching the students how to read the newspapers intelligently could not do much harm and might do some good. Something more on the lines of what used to be called civics—that seems to me to be the proper direction of reform. Perhaps I should add that, quite as much as elementary theory, such instruction would have to be carried out by teachers who had proper university qualifications in economics.

The trouble about this is that it does not lend itself to easy examining. How are we to lay down an examination syllabus to test the results of instruction which, if it is to fulfil its proper function, must be essentially inconclusive, designed to stimulate and inform discursively rather than to provide a system of thought which can be tested by hypothetical examples? There can be no doubt that the difficulties are very great; and since, in the modern age, the leaving examinations are so important, there can be no doubt that these difficulties are a severe obstacle to change. Nevertheless, I cannot believe that the problem is insoluble; and I should hope that, in frank and friendly consultation with those who have to do the business of teaching, it should not be out of the question for the great examining universities to work out syllabuses and modes of examining which would permit change in the right direction. There are indeed signs that this may happen.

III

I now turn to a subject with which I am better acquainted, the teaching of economics in universities.

Now I will not be so complacent as to suggest that the dangers which I conceive to be attendant on the teaching of economics in schools suddenly cease when the young people come up to the universities. I am sure that the dangers are still very real. I suspect that, in the ideal state, economics would be taken as a second degree or after some short experience of practical life; and I think that this is a strong argument for advising students who wish to take this subject to do their military service first: certainly there is

a marked difference between teaching social studies to boys fresh from school and to those who have had two years in the forces, just as there is a marked difference between teaching day students with no knowledge of the world and evening students coming in from business. Still, I think experience shows that, if we are careful, we can teach economics for a first degree to boys and girls fresh from school without manufacturing too large a proportion of prigs and with a fair hope of imparting useful techniques.

Nevetheless, if we are honest with ourselves, I think we must acknowledge that all is not well. I should be prepared to argue that a good honours degree in economics in certain English universities is as good an evidence of ability and training as is to be had almost anywhere in the world. But I am very far from believing that there is the same ground for satisfaction with the performance at the other end of the scale. A first or an upper second and perhaps a certain proportion of lower seconds mean something definite in the way of technical qualifications. But although, of course, there are always exceptions, in the main a poor lower second or a pass mean very little. As my colleagues know, I am not a fierce marker; and I do not believe in drastic change in traditional standards. But I confess I should be very sorry for any outside body of professional or business people to inspect the performances which qualify for degrees at the lower end of the scale; and I should like to make it clear that I speak with some experience of examining in several of our great centres of study and see no reason to distinguish between them in this respect. I think it must be admitted that the standard is poor. You have only to think of the answers being read aloud.

The fact is, I suspect, that in contrast to some subjects, in which an indifferent performance still implies some minimum of technical equipment, economics as a technical qualification is not much use unless at a high level of competence. This seems to follow from the nature of the subject. It follows too, I think, from our knowledge of the market. In my experience, at least, there has seldom been any difficulty in finding jobs *as economists* for firsts and good seconds. This was true even in the depths of the depression; and to-day they are snapped up almost before the ink on the class list is dry. But for the rest, I doubt whether the record of the appointments boards would show that the alleged professional qualification has very much relation to the jobs in which the candidates concerned eventually settle down. Modern employers know that really well-qualified economists have something specific to contribute, and they are quite willing to make special efforts to get them. But I do not think that they make much distinction between economics and other degrees at the lower end of the scale; and, speaking for myself, I would not say that they were wrong.

Reflecting on these circumstances, in recent years I have often found myself wondering whether the tradition of the honours schools in this country is really very well adapted to meet all the requirements of university education now that it has become accessible to such a greatly increased proportion of the population. Speaking broadly, I suppose that it would be

generally admitted that teaching for honours is very well done in English universities: I doubt whether anywhere in the world, except perhaps Scandinavia, a first degree with high honours means more. But are we sure that this system is the best, or even a good, system for the students who are not capable of high honours? Experience since the war, in the examinations I am acquainted with, shows that the increase of numbers has not been accompanied by anything like a proportionate increase of students with capacity for high honours. Are we doing our best for the remainder by forcing them to adapt themselves to the Procrustean requirements of a system which was designed essentially for the training not of large numbers of citizens, but rather of a comparatively small intellectual *élite*?

Different answers, I dare say, would be forthcoming in different faculties. But so far as economics is concerned, I am pretty sure what my own answer would be. I do not think that the techniques and the disciplines which we quite rightly require of the true honours candidate are really suitable for those who have not these abilities; and I suspect that being forced to study them does substantial harm to a substantial proportion of students. What good does it do the student, who is capable only of a poor lower second, to spend long days and laborious nights poring over the arcana of utility theory or the geometry of the analysis of the firm? Is it not as if we were to compel candidates with indifferent eyesight to spend their time staring at objects outside their focus? And if this is so, are not the psychological results likely to be bad? Is not the student in this position likely to become either rebellious or depressed and to leave the university in many ways less well fitted for the battle of life than if he had never been there?

I do not think that we can evade our responsibilities in this respect by saying that it is all part of a beneficial process ensuring the survival of the fittest. This seems to me to show an intolerably restricted and perverse set of values. A man is not necessarily a worse citizen if he is not at home in manipulating indifference curves, production opportunity slopes and the like. The greater part of the important work of the world is done by those to whom refinements of this sort will always be a mystery. Are we to say, therefore, that no one should come to a university who is not capable of high honours in the English sense? I should hope not; the example of the United States shows what a benefit it is for large numbers of the citizens to have had a general university training. But if we are not prepared to exclude the less academically gifted, it is up to us to devise modes of training which make better use of their time than the acrobatics of the honours schools.

In this connection I believe we suffer much from the discredit which in the modern age has come to attach to the idea of the pass or the general degree. This discredit is due partly to the abuse of such degrees at universities, where they were the refuge of those who were up for pleasure rather than education. It is due, partly also, to the very natural desire of heads of departments to have a large honours school. In my own day I have watched the honours system sweeping all before it in many universities, just at a time

when the desirability of its general prevalence was beginning to be very questionable. It is certainly arguable that, outside pure technology, general degrees covering a wider field of knowledge at a less intensive level are much better for many undergraduates than honours degrees involving extreme specialisation. For a very substantial proportion of the university population there is a strong case for the view that degrees of the kind taken under the old Scottish system and almost universally prevalent in Canada and the United States are much to be preferred.

What, then, are we to do? If we were starting *ab initio* there would be a strong case for modelling our system on trans-atlantic lines, regarding first degrees as being principally further general education and reserving specialisation for second degrees in special graduate schools. Secluded dons whose insular complacency was consolidated years ago by the gleeful reading of Abraham Flexner on some of the crudities of the rapidly evolving systems in the United States may feel that this is all wrong, and that we have absolutely nothing to learn from what goes on over there. This, of course, is just silly. English educationalists ignore at their peril the results already achieved under this system, especially in the graduate schools; in another quarter of a century if we do not improve our own arrangements, we may find ourselves seriously behind all along the line. But, be that as it may, I submit that there would be enormous advantage in an educational system planned so that all students capable of benefiting from a university education at all should all take first degrees involving a fairly wide spread of subjects suitably grouped, and only after that providing for intensive specialisation in graduate schools for those who have already proved their worth.

But, of course, we are not beginning *ab initio*, and we are not going to do anything so drastic. Moreover, things being what they are, I would not in the least advocate throwing the baby out with the bath water, and destroying a tradition—the tradition of our honours schools—of which we are justly proud. We have to work out our salvation in our own way, and I am sure that way will continue to give importance in first degrees to the teaching for honours schools. My own inclination would favour a solution in two stages: for the first two years all students should take courses of appropriately grouped subjects on what we may call a general level; then there should be a bifurcation, those who had proved their capacity, going forward to honours specialisation, others continuing for their final year with further general courses. I believe that this would have at least three advantages: it would preserve what is best in the tradition of the honours schools for those capable of honours; it would provide a foundation of general education which at present the honours student often very sadly lacks; and it would rehabilitate the general degree in a way in which, since it was linked with the first stage of the honours schools, would leave no doubt of its good academic standing. I do not say that this is the only solution. But for the purposes of this address it will be convenient to assume that something of this sort takes place.

In what follows, therefore, I shall discuss two distinct sets of problems: the problems of the general degree and the problems of the honours school.

IV

I turn next, then, to economics as a constituent of what I have called a general, as distinct from a specialised, honours degree.

Here the first point I have to make may be put in the form of a slogan: "Down to earth and cut out the indifference curves." I hope you will not infer from this that I wish to speak disparagingly of theory. On the contrary, now as ever, I think well of it and wish it a central place in the honours course. But when we are teaching students who are not going to pursue economics as a life study or as a profession, but who rather are seeking the elements of an all-round education which will teach them to think and help them to understand the world, I think we can overdo the emphasis on theoretical refinement; and I am pretty sure that nowadays this is very often done. Clearly, we are out to teach a certain basic minimum of general principle: it would be a great mistake to conceive the appropriate economics course at this stage to be nothing but descriptive. But what is needed is not refinement of analysis of the kind suitable for the theory paper in final honours, but rather thorough understanding of the great elementary platitudes of the subject—supply and demand theory rather than what may be called the metaphysics of the theory of value—combined with descriptions of the real world which permit exercises in the applications of these platitudes and provide some general feeling of the background of institutions amid which economic relations develop. At this stage it is much more important for a man to know, for instance, what the stock market is and how stock-exchange fluctuations affect the raising of funds by firms, than to be expert in distinguishing the significance of the difference between measurable and immeasurable utility or the four different kinds of cost curve.

In this connection, I sometimes doubt whether teachers have been altogether helped by recent text-books. I can think of several text-books which are an excellent introduction to theory for the honours course. But I am much more at a loss when I think of the requirements of the type of course which I have at present in mind. In my student days this need was superbly met by works such as Taussig's—works which set forth the broad principles of the subject on an adult plane of exposition and on a scale sufficient to do justice to the subject, but avoiding the higher technicalities. Economics has moved on since then; and modern thought would require considerable reformulation of important sections in such books—particularly those relating to national income and employment. But I cannot think of good substitutes. I know of one or two most excellent introductions for the first year—Dr. Benham's, for instance. But works which deal with the subject at the length and with the weight of argument and illustration of Taussig or Pierson are still, I think, to be written. Till then we have to carry on by reference to a miscellany of works, each approach-

ing special parts of the subject from its own special point of view. Doubtless this has some advantages in fostering width of reading and capacity for selection. But I doubt if these outweigh the disadvantages of the absence of a unified follow-through. We burden students unduly, if at this stage we require them to compile their own Principles of Economics.

So much for the central course in principles. This will doubtless be accompanied by more specialised descriptive courses dealing with contemporary problems and contemporary economic developments, about which I have nothing special to say. But what of the other subjects? What are suitable companions for economics in the type of degree I am contemplating?

It should go without saying, I hope, that the closest of these should be economic history. Indeed, it is difficult to draw the line between economic history, which is the descriptive economics of the past, and descriptive economics, which is the economic history of the present. I am sure that the more economics and economic history get mixed up, the better for both kinds of teaching. I know that fifty years ago economic history was not very well done and was often written by men who had a positive antipathy for economics. But a great deal has happened since then. To-day there is no obstacle to regarding economic history as an essential complement to economics at every stage.

But even when it is combined with economic history I do not think that economics in this wide sense is a good liberal education in itself or a sufficient training for the understanding of the world around us. The economic aspects of society are important. But they are not the only important aspects; and studies which are exclusively focused in this direction are apt to be not merely one-sided but also positively misleading. For a balanced approach to the study of society they need to be accompanied by systematic training in at least two other spheres.

First comes politics with its two divisions: political organisation and the history of political thought—in my judgment each equally important. Political organisation is surely almost indispensable even to an understanding of economic problems: how, for instance, can we teach public finance to people who have no general understanding of the machinery of government? But the history of political thought is not less indispensable: how can we properly appreciate the social movements, even of our own time, if we have no acquaintance with the broad perspective of thought concerning political obligation and the nature of social justice?

Secondly, comes history in its more general sense as distinct from economic history. In this context, this serves two functions: it provides a general accompaniment to economic history; and it provides background for the study of politics. Of course, there can be no question of detailed history in the specialist sense in degrees of this kind; and I know that many modern historians, lacking the spacious conceptions of their predecessors, are reluctant to consent to teach anything else. Nevertheless, more generalised teaching is clearly possible; and, properly conceived, can be well

adapted to the requirements of a general degree in social studies. Whatever may be urged to the contrary, to acquaint students with the broad perspective of European and Modern American History it is really not necessary to teach them the ultimate uses of the historical microscope.

V

And now at last I am free to turn to the problem of honours teaching—that is to say, the problem of teaching economics, not merely as part of a general education but also as a professional qualification. This, of course, is the sphere which most of us find most congenial. Here are no problems of tempering the wind to shorn lambs. Here is a stage at which no difficulties need be concealed, no hesitations left unexpressed. Given the field to be covered, we can teach without inhibition.

Nevertheless, even here there are problems. What is the field to be covered? What are the requirements which need to be fulfilled before we can say of the training we give, that it is a training for professional economists? And when we have settled the constituent subjects, what length of course do we need?

Let me say at once that I assume as an essential prerequisite, the grounding in associated social studies which I have already discussed in connection with the general degree. I regard honours specialisation which does not have this background as seriously defective, even having regard to the most strictly professional requirements. I will not say that a man who takes honours in economics knowing nothing of politics or history is no good to anybody. We know that some of the most famous schools have tolerated this degree of specialisation; and I should be sorry to be thought to be passing general condemnation on their many distinguished *alumni*. But I do say that he is not nearly so qualified to be useful—or sensible—as he would be if he had a wider basis. There was a long period in the history of the London degree when it was possible to get a first in Economics (Analytical and Descriptive) without having heard (officially) of Plato's Republic, the American Constitution or even the French Revolution—and a great many students did. Thinking of the men and women whose education was thus warped, I often feel a certain sense of personal guilt for having put up with it so long without protest.

But assuming that this danger has been circumnavigated either by the provision of a Part I, as I have suggested, or by the requirement of a proper complement of subsidiary subjects, there still remain problems of scope and length, and it is these to which I wish to devote the final parts of this address. I say nothing here about specialisation *within* the honours field: I think general considerations suggest that there is scope for specialisation in finance, in industry and in regional and inter-regional studies; and experience shows that this may be fruitfully practised. I restrict myself to problems of a more general nature.

First, a question of scope: how up to date should we be? How near to

the frontiers of recent discovery do we expect the student to go at this stage? How much do we expect him to know of the controversies in the very last numbers of the journals?

This is a problem to which I do not think a very cut-and-dried answer is possible or even desirable. Obviously in periods of rapid advance, when perhaps our own opinions are changing, it would be wrong, even when teaching for a first degree, to conceal from students doubts and hesitations which affect the status of important propositions. Moreover, when new suggestions have been made and seem tolerably convincing there is a certain educational value in encouraging the student to participate in the process of testing them. I count it an important requirement of proper honours teaching that it should convey the impression of being concerned with a subject which is open ended.

Nevertheless, if a subject is to be open at the ends, it must at least have some sides; and I submit that preoccupation with contemporary controversy to the neglect of foundations is educationally very bad. Economics is a serious subject. It is a subject which in many ways has demonstrated its practical utility. It is really much more important that the honours student should be thoroughly grounded in the main principles than that he should be absolutely informed of the *dernier cri* of the most recent fashion. In training students in this most difficult branch of knowledge we must not forget the dreadful example of the man in the fable who could see the fly on the barn door but who could not see the barn door itself.

It is in this connection that I would specially commend the history of economic thought as an essential element in the honours course. By this, of course, I do not mean highly detailed study of the kind with which the work of men such as Jacob Viner has made us familiar. Valuable as it is, that is a subject for the graduate school. I mean rather the broad study of tendencies as revealed in well-known works—the writers represented in Monroe's excellent collection and the main works of the great eighteenth- and nineteenth-century writers, Smith, Ricardo, J. S. Mill, Marx, Jevons and Marshall. It is an ideal educational subject—with excellent texts and commentaries. I cannot think of a better way of conveying the sense of open-endedness than the study of the vicissitudes of thought in the past. Nor can I think of a better way of acquiring, so to speak, a sense of the three-dimensionality of the subject than by working through, in the appropriate historical settings, alternative attempts at solution of recurrent typical problems. It is, moreover, a good inoculation against charlatanism. It is difficult to believe that anyone who has had a proper training in the history of thought would be guilty of the claims which have so frequently lent amusement to the literature, especially of the last twenty-five years.

But what about mathematical economics? To what extent should proficiency in this branch be a compulsory requirement of honours?

In my judgment, this is inadvisable. But let me guard against misunderstanding. I have no objection to mathematical methods, and it is one of my complaints against education in the schools that so many students

arrive in the economics faculties, who tremble and grow grey with fear if a simple diagram or formula is put upon the blackboard. The question whether it is sometimes useful to put economic propositions in mathematical form has been long ago settled; it is no longer intellectually interesting. We take it for granted nowadays that, in the treatment of some parts of the subject, an occasional resort to simple mathematics is quite a normal thing.

But to say this is one thing; to say that a separate division of the subject entitled mathematical economics should be compulsory on all students taking honours economics is another. To such a proposal I should see very great objection. I should regard it as intolerably restrictive. It is probably true that not eighty per cent of contemporary professional economists could survive an ordeal of this nature; and although this is doubtless a very deplorable state of affairs, it does seem to indicate that it is possible to do work of value in some parts of the field without being expert in this respect. I think that mathematical economics is a division of the subject which should be fostered; it deserves a place in the programme of a properly articulated department. But at this stage, at any rate, where examinations are concerned, that place is the place of an option—as it is in the London degree—not a part of the syllabus compulsory on all candidates.

In contrast to this, I would say that the opposite status should be given to a paper in economic statistics. In my judgment, an honours degree in economics should not be awarded to any candidate without a certain minimum degree of competence in this subject. By this I do not mean expert knowledge of advanced statistical method—which is a professional qualification in itself. I mean rather a thorough knowledge of sources, coupled with proved ability in tabulation and the more elementary methods of analysis—the subject matter, if you like, of Professor Allen's *Statistics for Economists*. It is clear that it is impossible to go very far in any direction without this kind of competence. It is also clear that it is an absolute prerequisite of the kind of practical work which our honours graduates are expected to do later on. It is perhaps the chief technical qualification which the outside world has the right to demand of any applicant for a job who comes bearing our certificate of competence.

Finally, in this connection, what of the applied side—that perennial anxiety of the conscientious teacher. I am afraid I have no open sesame here: I think it is much the hardest part of our job as teachers to convey to students correct perspectives as regards the contemporary scene and a proper sense of what is relevant in handling applied problems. I will only say that while I think some lecturing is indispensable, I fancy that this is the part of the field where, by itself, it is least adequate. In my experience, the only way in which the student can acquire adequate knowledge and correct technique is by continual written exercises in the presentation of statistics and the analysis of the raw material of the subject, evidence before royal commissions and government inquiries, company reports, ministerial pronouncements and so on and so forth. I count a man unqualified as an

economist who, given access to the necessary material, is not able to present, in clear, unambiguous English, a memorandum capable of serving as the basis of discussion at a Civil Service working party or at the meetings of a company board. Having regard to the lamentable neglect nowadays in schools of the all-important art of *précis* writing, this is not an aptitude which can be acquired without quite extensive practice.

VI

But this brings me to the last consideration which I wish to lay before you—a consideration relating to the length of course necessary to become a properly qualified economist. I want to submit that the three years now usually taken for first degrees are insufficient for an honours course as I have depicted it. Four years, rather than three, are the appropriate period.

I have not reached this conclusion without considerable reluctance. For, obviously, there are strong practical reasons militating against action based upon it. But from my point of view the evidence in experience has been conclusive. Thirty-five years ago when I was a student the honours course in London was one of wide scope: it included the other ingredients whose claims I have urged on your attention. Then, towards the end of the twenties, this was changed; the weight of the ancillary subjects was thought to be inimical to proper concentration on the honours subject, and the degree was remodelled so as to permit of much greater specialism. Twenty years of that convinced us that that degree of specialism had all the disadvantages I have mentioned already; and five years ago we changed again so as to permit a greater width of coverage: our Part I now covers economics, politics and history in equal proportions. But, alas, the result is still unsatisfactory. Part I takes two years, and the further year is not enough for a really thorough honours training. I will not say that on balance the change is bad: I do not think that this is so. The defects of premature specialisation are gone—we no longer run the risk of producing educational monsters—and students who get firsts or good seconds will certainly hold their own with the products of most other centres. But the better is the enemy of the good. Part II, the honours training, is too much of a scramble: it is impossible to be sufficiently thorough. The students are only beginning to acquire the expert touch when they have to prepare for the final examinations. They do not have enough time to sit back and meditate on the field as a whole.

Thus it seems that so long as we are confined to a three-year honours degree we are faced with two disagreeable alternatives. Either we have adequate specialisation but not enough grounding in auxiliary social studies—in which case we run the risk of producing lop-sidedness and defective judgment. Or we have adequate grounding but not enough specialisation—in which case we are not giving an adequate professional training. I see no escape from this dilemma within the limits of the time available. The only remedy is to take longer. Three years is too little. The solution is a four-year degree.

Why cannot this be? Various arguments are put forward. But I do not find any of them very convincing.

It is said, in the first place, that three years ought to be sufficient, that there is something wrong with our conceptions if one cannot get a satisfactory honours degree within that time limit.

To which, I answer, why? What is there in the nature of things which makes it inevitable that this particular discipline can be taught in just three years and no more? We should not dream of arguing thus about degrees in medicine; we are much too anxious to be properly advised when we are sick. Yet it is arguable that to learn the anatomy and physiology of economic society involves quite as much as to learn the anatomy and physiology of the human body. Moreover, it is just not true that four years is so exceptional in university tradition. It is not at all unusual abroad. And even nearer home, at Oxford, in the study of the classical humanities, it used to be nothing unusual to take two years for Honour Mods. and two years for Greats. I am sure that the course I have suggested is quite as exacting as that.

Secondly, it is argued that the change is out of the question because of the burden already imposed on the students' time by the claims of military service.

Admittedly, the burden is considerable; and the resistance to change which is thereby created is very great. But does this make any difference to our conception of the time necessary to train doctors? And if we are sincerely convinced that an extra year is necessary for the proper training of economists, ought we to take our own profession any less seriously?

Thirdly, it is said that the additional expense will be prohibitive.

Here I submit that the case is unproven. Most university students nowadays receive some subventions from the state or from local authorities. We have yet to learn that such subventions would not be prolonged for an additional year, if responsible educational opinion urged that it were necessary. Indeed, such limited inquiries as I have been able to make are not conducive to extreme pessimism.

Finally, it is said that the proposal with its distinction between the four-year honours and the three-year general degree would be contrary to the egalitarian spirit, that it is wrong to make any distinction between students who are capable of benefiting from a longer course and those who are not so capable.

This seems to me to misconceive the proposal. No one is suggesting that there shall not be equal opportunity: the idea of a Part I which is common for all students is designed for just this purpose. All that is suggested is that a course of study longer than is necessary for a general degree is necessary to make a properly qualified economist. If this is true—and, of course, the whole argument depends upon that—then, if we want to turn out people with this kind of professional qualification, the extra time is surely justified: he who wills the end, wills the means. The fact that some students do not qualify for admission for this kind of training should surely not lead

us to undertrain those who do. If the egalitarian spirit denies that, so much the worse for the egalitarian spirit.

The alternative, of course, would be to go right over to the American system. Let all first degrees be general degrees and then train for professional qualification in the graduate school. As I have argued earlier, there would be much to be said for this, if we were starting entirely from scratch. But given the present organisation and habits of English universities in general, it would clearly be much more disturbing of existing arrangements than the less ambitious change which I have been trying to advocate.

All this, however, is still very controversial. The debate is in its early stages, and opinion is as yet unformed. If the view be accepted that the main needs of our honours degrees in the modern age have been greater width and greater length, it is probably a fair summary of the present position to say that whereas the struggle for greater width is more than half over, the struggle for greater length has only just begun.

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INTERACTIONS OF CYCLES AND TRENDS

I

Most of the recent writers on cycles and trends do one of three things: some argue that cycle and trend are so intertwined as to be indistinguishable; some indicate that a trend can be introduced into, or derived from, a model of the trade cycle, so that a trade-cycle theory can be used to " explain " the trend as well; while others maintain that information about the trend is essential to a satisfactory explanation of economic fluctuations. Schumpeter was the leading exponent of the first view, but his position has recently been reiterated by younger economists who have tackled the problem afresh, including Goodwin and Merlin.[1] Tinbergen and Kalecki are among those who derive their trend from the same system of analysis which they use to explain economic fluctuations. For Tinbergen, indeed, the trend seems to be little more than a statistical residue. Dynamics is merely a matter of dated variables, and if cycles are not explosive, long-run development is not affected by them.[2] Similarly, Kalecki derives his trend from the same fundamental set of equations which he uses to explain economic fluctuations. Certain variables, which were held constant for business-cycle analysis, are made subject to long-run changes to produce a trend. Kalecki, however, does conclude that long-run development is not inherent in the capitalist economy; specific " development factors," of which innovations are most important, are required to sustain growth, especially in view of the drag imposed by rentiers' savings.[3]

Professor Hicks is the most notable representative of the third group. The theory of trend is an essential underpinning for his theory of economic fluctuations. In expressing his debt to Harrod he says that " it was not until I read Mr. Harrod's book that I realized what it was that I had overlooked. Then everything began to fall into place." He speaks of " the necessity of approaching the business cycle as a problem of an expanding economy." Dr. Hicks, however, does not spell out the highly interesting implications of his own theory of fluctuations for the theory of economic development in turn.[4]

Mr. Kaldor's position regarding cycles and trends is somewhat ambiguous. He begins his article on the subject by insisting that it is possible to conceive, on the basis of Keynesian theory, economic fluctuations without economic growth. At the conclusion of his article, however, he says that " it is the strength and duration of booms which shape the trend rate of

[1] R. M. Goodwin, " The Problem of Trend and Cycle," *Yorkshire Bulletin*, Vol. 5, No. 2, August 1953, pp. 89, 90; Sydney B. Merlin, *The Theory of Fluctuations in Contemporary Economic Thought* (New York, 1940), especially p. 153.

[2] Jan Tinbergen and J. J. Polak, *The Dynamics of Business Cycles* (Chicago, 1950), especially pp. 10–11, 82, 103 and 112–35.

[3] M. Kalecki, *The Theory of Economic Dynamics* (London, 1954), Part 6.

[4] J. R. Hicks, *A Contribution to the Theory of the Trade Cycle* (Oxford, 1950), especially pp. 6–10.

growth," and—a more accurate statement of his own findings—" the same forces therefore which produce violent booms and slumps will also tend to produce a high trend rate of progress; though the connection between the two is far too complex to be reducible [at present] to a simple mechanical model." Moreover, in his final paragraph he writes, " Schumpeter's hero, the ' innovating entrepreneur,' whom we dismissed so summarily and rather contemptuously at the beginning, is found, after all, to have an honorable place, or even a key role, in the drama—even though we prefer to endow him with a rather more variegated character." [1] Thus Kaldor seems to end on the side of those who contend that economic growth and the economic fluctuations observed in the real world have a common cause.

In my view, none of these analyses exhausts the interactions of cycles and trends. The relationship is a two-way one. One can conceive of economic growth without fluctuations, and of economic fluctuation without economic growth. The essential causal factors of fluctuations and growth can, and should, be analysed separately. At the same time, actual fluctuations will be markedly influenced by the growth factors, and the actual trend will be very much affected by economic fluctuations.

For the purposes of the present article, I shall begin with the hypothesis of an autonomous trend, based on autonomous investment. I shall inquire briefly as to whether autonomous investment could conceivably produce a smooth curve of economic growth, without significant fluctuations. I shall analyse more fully the effects of the autonomous trend on the amplitude and duration of economic fluctuations, in terms of the Hicks model of the trade cycle. I shall demonstrate the effects of the changing pattern of economic fluctuations on the actual, historical trend of income and employment. Finally, I shall apply the analysis to two cases: the " great depression " in the United States and stagnation in underdeveloped areas.

II

The following symbols are used:

I_A Autonomous investment (gross)
I_A^R Autonomous investment in real terms (at constant prices)
O_p " Potential " output. (Gross national product at full employment with constant prices)
O_A Gross national product (at constant prices) produced by autonomous investment alone
O_h Actual " historical " or statistical trend of output. (Actual gross national product at constant prices)
Y_h Actual (historical) gross national income
L Labour force (population)
K Stock of known resources
Q Stock of capital

[1] N. Kaldor, " The Relation of Economic Growth and Cyclical Fluctuations," ECONOMIC JOURNAL, March 1954, pp. 53–71.

T Level of technique. [If f is the production function, $O_p = T.f(L, K, Q)$]
t Time
$\dot{L}$ dL/dt
$\dot{K}$ dK/dt
$\dot{T}$ dT/dt
S Savings
k Any positive constant
M Super-multiplier

We shall assume that there is an autonomous long-run investment function:

$$I_A = \phi(\dot{L}, \dot{K}, \dot{T}) - \psi(Q). \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

By " autonomous " is meant that this category of investment is dependent only on long-run rates of population growth, resource discovery and technological change, and to a lesser degree on the long-run rate of capital accumulation, but is not affected by current short-run changes in the rate of output, level of profits or the like. " Induced investment," on the other hand, is a function of the level and change in output, whether directly or through profits. Autonomous investment is thus considered causally independent of short-run fluctuations, and not as a mere statistical residue derived by " eliminating " cycles.

Since we are conducting our analysis in terms of gross investment, the long-run growth of the stock of capital, Q, will have a two fold effect: it will in itself increase the need for replacement; and in the long run, as in the short, capital accumulation will in itself act as a drag on the flow of new investment decisions. The first effect will probably be small, especially if, as Professor Hansen maintains, innovations are increasingly capital saving. The second effect may be more substantial, although small relative to the impact of the " growth factors." The net effect will almost certainly be negative, and may be significant. At this stage, however, we shall assume that the two effects offset each other, so that $\psi(Q)$ can be ignored in a first approximation.

For the time being, we shall also assume $S = S(O_h)$. In other words, we shall treat the trend of savings as a series of short-run positions, unaffected by separate long-run causal factors. This treatment is an abstraction, but it is a useful simplification. Trends in the propensity to save, arising from such factors as the increasing ability to think in terms of and provide for a remote future, stressed by Harrod, can be introduced at a later stage of the analysis.

For lack of information about the trend of technological progress, we shall assume that $dT/dt = k > 0$, so that $d^2T/dt^2 = 0$. This formal simplifying assumption may not be an unrealistic one. Lacking adequate measures of technological progress, it is virtually impossible to say whether the rate of technological progress, in the relevant sense of a factor governing autonomous investment, is higher to-day than it was in the nineteenth

century, and whether it was higher in the nineteenth century than in the eighteenth. However, changes in the rate of technological progress can also be easily introduced into the analysis where and when appropriate.

We shall also assume that population growth and discovery of new resources follow a normal growth curve. In more precise terms, $\dot{L}$ and $\dot{K} > 0$; d^2L/dt^2 and d^2K/dt^2 are first > 0 and then < 0. Judging from available information, these assumptions are realistic enough.

On these assumptions,

$$dI_A/dt = \frac{\partial \phi}{\partial \dot{L}} \cdot \frac{d^2L}{dt^2} + \frac{\partial \phi}{\partial \dot{K}} \cdot \frac{d^2K}{dt^2}.$$

Accordingly, I_A will itself follow a normal growth curve, unless $d\phi/d\dot{L}$ and $d\phi/d\dot{K}$ move in an offsetting manner, so as to produce steady growth, a slim possibility that we shall ignore.

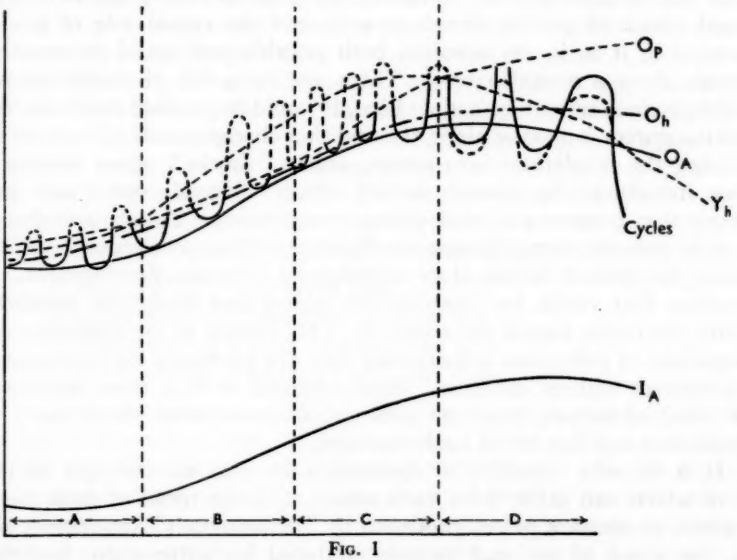

FIG. 1

Now let $O_A = M \cdot I_A^R$. In this context M is the super-multiplier; but unless the rate of increase in autonomous investment produces rates of growth that inevitably call the accelerator into action, the super-multiplier will approximate the simple Keynesian multiplier. The super-multiplier comes into play only in periods of relatively rapid growth, when fluctuations would arise anyhow. This point will be discussed further below. For the moment, however, we shall assume that the relevant multiplier is constant. Consequently, the trend of total output O_A will also follow a smooth growth curve, as in Fig. 1.

According to the analysis presented in an earlier article,[1] the curve O_h

[1] B. Higgins, "The Theory of Increasing Underemployment," ECONOMIC JOURNAL, June 1950.

of actual " historical " output would tend to follow the curve of O_p, of real income at full employment without inflation, until dI_A^R/dt begins to fall significantly, as a result of the falling rate of population growth and resource discovery, ($\dot{L}$ and $\dot{K}$), after which a gap will appear, and $d/dt\,(O_p - O_A) > 0$. In money terms, $(Y_A - O_p)$ may be positive and even growing up to the inflection point in O_p; that is, there may be a chronic inflationary gap. Whether the actual trend will be consistently above the trend of full employment at constant prices, in this range, would depend partly on the parameters S and ϕ in the above equation.

In view of the power of the accelerator, once brought into play, it may be asked whether smooth development along such a growth curve (as distinct from *steady* growth) is conceivable at all. This question is different, it should be noted, from asking whether it is likely; about the latter question there can be little doubt. However, in order to distinguish between the causal effects of growth factors as such and the causal role of economic fluctuation, it is, in my opinion, both possible and useful to conceive of growth along a smooth curve. There are three sets of conditions which might produce smooth growth. First, it would be possible to assume simply that the system *is* moving along O_A, and that changes in dO_A/dt are too small to bring the accelerator into action, unless " shocks " occur greater than those introduced by growth factors alone. Second, one could simply assume that government stock-piling or counter-speculation is undertaken, so as to prevent sharp changes in dO_h/dt, and thus to eliminate the cycle, leaving the growth factors alone to influence economic development. Any situation that could be produced by policy has analytical significance. Third, we might regard the trend $O_p - O_A$ merely as an indication of the magnitude of price–cost adjustments that are necessary for continuous full employment without inflation. With any one of these three assumptions, the trend of output, based on autonomous investment alone, has a clear significance and is a useful analytical tool.

It is therefore possible to distinguish at least six concepts of trend; all of which can differ from each other: O_A, the trend of gross national product, at constant prices, produced by " autonomous " investment alone; Y_A, the trend of national income produced by autonomous investment, $[O_A - Y_A]$ reflecting any trend in prices; O_p, the trend of gross national product at full employment and constant prices; Y_p, gross national income at full employment, but allowing for price trends; O_h, the actual historical, or statistical trend, which will be some sort of average position of actual national real income over the course of cycles of various kinds; and Y_h, the analagous statistical trend of national income, including price changes.

For the purpose of determining what policies are best designed to maintain full employment without inflation, it is useful to distinguish between Y_h and the statistical or historical trend as it would have been without government interference of any kind, which we might denote by Y_f, the " free " historical trend. Up to 1940, it is hard to say what the sign of $(Y_h - Y_f)$ would be; in most countries, and for the most part, it appears that govern-

ment action has accentuated both booms and depressions, while accelerating growth through development works and subsidies to private investment of a developmental nature. In advanced countries this effect has probably been weaker since 1913 than it was during the eighteenth and nineteenth centuries. Since 1940, because of the continuing high level of government spending, there can be little doubt that $(Y_h - Y_f)$ is positive, especially in the United States.

The question may be raised as to whether $O_A = O_p$. Suppose growth were a slow, and slowly changing, affair, based on long-run factors alone, so that the accelerator never came into action. Would there not be price–cost adjustments that would bring full employment? Hicks' whole analysis implies that $O_A < O_p$; it takes induced investment to raise income to full-employment levels. Considering how rare a phenomenon full employment is, if one considers all countries, I am inclined to agree with Hicks. I do not wish to reopen here the debate on price flexibility and employment; my own views on the subject have been expressed elsewhere.[1] But even in advanced countries, full employment has occurred only during wars and at the peak of the booms, while in underdeveloped countries mass unemployment is the rule. It seems to take an unusually favourable combination of growth and cyclical forces, including government policy, to produce full employment for any length of time. Until faced with strong evidence to the contrary, therefore, I shall accept Hicks' view that $O_p > O_A$.

We can now distinguish four phases of economic growth (see Fig. 1):

A, where dO_A/dt is low, and $d^2O_A/dt^2 > 0$.
B, where dO_A/dt is high, and $d^2O_A/dt^2 > 0$.
C, where dO_A/dt is high, and $d^2O_A/dt^2 < 0$.
D, where dO_A/dt is low, and $d^2O_A/dt^2 < 0$.

Now let us introduce a cycle of the Hicks type, generated by any shock—say a war scare—which lasts only one period. Clearly, the nature of this cycle will vary, according to the phase of economic growth. Six separate causal factors in the cycle will be influenced by the rate of economic growth.

1. The slope of the " ceiling " (O_p). The Hicksian boom comes to an end because of the decline in the rate of growth of output involved in the shift from expansion based on his " super-multiplier " to a rate of growth determined by the slope of his " ceiling," which in my terminology is " the trend of potential output," or national income at full employment and constant prices. Now the potential trend, as well as the autonomous trend, will, of course, taper off when the rate of growth in population (labour force) and supply of known natural resources tapers off; if the rate of technological progress is constant, there is no reason why it should taper off earlier, and if the marginal propensity to save is also constant, there is nothing to prevent a deceleration of the rise in O_p, if the supply of labour and of natural resources grows less quickly. Thus at about the same time as the gap between potential and historical trends occurs, booms will weaken. While the " ceiling "

[1] B. Higgins, " The Optimum Wage Rate," *Review of Economics and Statistics*, May 1949.

is rising rapidly, the shift from expansion based on the super-multiplier to " creeping along the ceiling " does not involve a sharp fall in the rate of expansion, and with lags of significant length the boom can go on for some time. But when the " ceiling " is flattening out, the drop in the rate of expansion when the ceiling is hit becomes greater and greater, and the boom cannot last long after the ceiling is hit. Since there are really a number of " ceilings " in different industries, a slow rate of growth in full employment income might mean that downturns would occur even before full employment is reached in all industries, particularly if there is some immobility of factors of production. Thus the effect of the changing rate of growth on cycles will be such that booms will be of short but increasing duration in phase A, of moderate to long and increasing duration in phase B, of long to moderate but decreasing duration in phase *C*, and of short and decreasing duration in phase D.

There is an aggravating effect of the trend on the slope of the ceiling, which is more indirect. " Full employment " is in reality not a point but a zone, and the extent to which it will pay to expand the effective labour force, by double or triple shifts, postponing retirement, attracting housewives into employment and the like, will depend partly on the size of the capital stock. If the " trend " factors are such as to call forth vigorous booms, the stock of capital will tend to grow rapidly in the early stages of the upswing. This accumulation of capital will in itself make the slope of the " ceiling " steeper, postponing the downturn. Thus if a slackening of growth factors tends to weaken booms (for reasons given below), there will be an *additional* tendency for the ceiling to flatten, because of the slower rate of capital accumulation—which will shorten booms further—and so on. This cumulative effect will be partly, but only partly, offset by the accompanying alleviation of the " drag " imposed on new investment decisions by capital accumulation. Unfortunately, the unfavourable drag on investment decisions depends mainly on the *level* of Q, which grows so long as there is any net investment. The favourable effect through making the ceiling steeper depends mainly on the rate of increase in Q in the early phases of the upswing. If the capital accumulation in the early upswing is reduced through a weakening of growth factors, but is still positive, the net effect of the consequent flattening of the ceiling, on the one hand, and the slower *rate of increase* in the " drag " of capital accumulation on new investment decisions, is bound to be unfavourable. The effect on the slope of the ceiling will also depend partly on the composition of new investment. For example, additions to the stock of housing will increase the slope of the ceiling less than new manufacturing plant.

2. The slope of the " floor." The upturn in the Hicks model comes from the shift in direction of movement in hitting the " floor," which is essentially the equilibrium rate of growth, based on the " autonomous " investment alone. If this equilibrium rate of growth is rapid, the upturn will come very soon after the floor is hit. If the rate of growth is slow, the depression can last a long time. Thus, so far as this factor is concerned, depressions will be

long but shortening in phase A, of moderate to short and diminishing length in phase B, of short to moderate but increasing length in phase C, and long and lengthening in phase D.

3. The change in g, the equilibrium of growth. It will be recalled that in Hicks' model the " middle point " for the accelerator coefficient, above which cycles become explosive, is $(1 + g)^2$, where g is the equilibrium rate of growth. Obviously, the lower g, the lower is the middle point. With a given value of the accelerator (above unity), a declining g means that the accelerator is farther and farther above the middle point, and accordingly cycles would become more and more violent. Since in real terms, or employment terms, amplitude can increase in the downward direction only, a declining equilibrium rate of growth would mean more rapid downswings. Of course the " floor " is reached sooner if the downswing is more rapid, but when the effects of the downswings on expectations and Marrama's " rationality factor " (which Hicks ignores) are taken into account, it seems likely that the more violent downswing will mean that the " transformation " of the accelerator in the downswing will last for some time after the floor is reached. That is, it will take a longer period of sustained increase in output to start induced investment and launch an upswing. When the effect of the decline in g on the position and slope of the " floor " is also taken into account, it seems clear that the net effect will be more violent downswings and longer depressions; the combined effect will increase the average unemployment during depression, pulling down the historical, statistical trend.

Even if Hicks is wrong and the accelerator of the real world is below the middle point, a decline in g would cause increasing underemployment, in the form of a growing gap between the potential and historical trends. For the closer is the accelerator to the middle point, the slower is the rate of damping of cycles induced by " erratic shocks "; as the middle point drops, unless the accelerator drops too or shocks become weaker (and there is no obvious reason why either of these things should happen), the average amplitude of cycles induced by erratic shocks will increase—which in real terms means increasing in the downward direction.

Thus in phase A fluctuations will tend to be extreme to moderate—in *percentage* terms—but diminishing; during phase B their amplitude will be moderate to small, and diminishing; during phase C their amplitude will be small to moderate but increasing; and in phase D their amplitude will be large and increasing, in both percentage and absolute terms. Since in real terms booms are limited by the full-employment ceiling, this means that during phase D, the booms are shortened, while the amplitude of the downswing is increased.

4. The changes in the stock of capital. The stock of capital will start very small, and grow continuously except in deep depression. An industrially mature nation will have a large stock of capital, and consequently a low marginal productivity of capital (apart from technological progress). Now Hicks' " floor " to the downswing is determined partly by minimal autonomous investment, and partly by the maximum amount of net disinvestment.

Obviously, the more capital an economy has, the more disinvestment is possible, and the lower the floor to the cycle can be. This relationship provides another reason for supposing that in an economy where total output is growing at an increasing rate, the historical (statistical) trend (in real terms) will be close to the potential trend (in real terms). In such an economy the stock of capital is usually small; while in an economy where output is rising at a decreasing rate, and the stock of capital is large, the historical trend will fall farther and farther below the potential trend.

In other words, the " downward displacement " of the floor grows, at least until downswings become very violent and depressions very long.

5. For completeness, we should introduce the possibility of a long-run rise in the marginal propensity to save. This might weaken upswings by reducing the multiplier. However, by diminishing the degree of change in rate of growth when the full-employment ceiling is hit, an increasing marginal propensity to save may prolong the boom, so long as the accelerator is high. Thus the effect of this factor is uncertain. Regular cycles require a constant multiplier. If the marginal propensity to save rises with national income in the long-run—as seems likely—the upswings will be weakened. The downswings will be less affected, because of the operation of the " Modigliani factor " and of Hicks' " transformation " of the accelerator. According to the Modigliani principle, the marginal propensity to save is reduced in the downswing, the degree to which savings are squeezed out in the downswing depending on the extent of the fall in national income from the previous peak. The lower the peak, the less saving is squeezed out, and the less the downswing is damped. Also, according to Hicks' principle of " transformation," the floor to the downswing is set by the rate at which capital can be consumed, which does not depend on the multiplier at all. Thus the long-run tendency for the multiplier to fall, as very high levels of national income are reached in advance countries, will weaken booms without shortening depressions or checking downswings.

6. The accelerator itself might rise as the production structure becomes more complex, and business-men become more cycle-conscious. If so, this factor in itself will tend to accelerate and shorten booms as the economy grows. However, this factor operates in the opposite direction from the trend in the multiplier, and consequently the super-multiplier may not change markedly in the course of economic growth. We can justifiably, therefore, concentrate on the first four of the six factors influenced by economic growth.

The results of our analysis thus far are summarised in Fig. 1. We began with a curve of autonomous economic development (O_A), based on autonomous investment (I_A), which follows a growth curve because population growth and discovery of resources follow growth curves, while the other major determinant of autonomous investment, technological progress, proceeds at a steady rate. We then introduced a cycle of the Hicks type. We showed that in phase A fluctuations will have considerable amplitude, measured in *percentage* of national income. The historical trend, O_h, will lie

below the potential trend, O_p, but will gradually approach it. Because of the long, deep depressions, the historical trend of national income, Y_h, will also lie below the historical trend of real income, O_h. However, the gap will not be large.

Since in this phase of development both investment and savings are small, any event which brought a substantial increase in investment would tend to produce an explosive boom. With such a small base, any substantial investment means a high percentage increase in investment, while the increase in income (dY/dt) will still be small for some time, so that the increase in savings (dS/dt) will also be small. In this sense, and only in this sense, there will be a " chronic inflationary gap "; *given* any phenomenon calling forth a significant amount of investment, an inflationary boom will tend to set in.

Towards the end of this phase, as booms are strengthened and depressions weakened by the appearance of a significant rate of economic growth, the curve of historical national income (Y_h) may cross the curve of national real income (O_h). Thus the curve of Y_h will be below O_p, in the earliest stages of economic growth, and towards the end of the first phase may rise above it.

In phase B, up to the inflection point, booms get longer and stronger, and depressions shorter and weaker. By definition, the statistical or historical trend, O_h, must lie below the trend of national income at full employment without inflation, O_p; but towards the end of the second phase these two curves will be very close together, because of the combination of inflationary booms, and a " chronic inflationary gap " in the *trend* sense as well, arising from the increasing rate of growth, the curve Y_h will lie above the curve O_p. *A fortiori*, therefore, Y_h will lie above O_h.

In phase C the booms will be long and strong, but shortening and weakening. The depressions will be short and shallow at first, but will deepen and lengthen as time goes by. Thus the curve O_h will fall farther and farther below O_p, both from the effect of long-run trend factors on the two curves and also as a result of the changing pattern of economic fluctuations. For the same reason, Y_h will eventually fall below O_p as well.

In this phase the depressions will be more serious than in phase A, although the rate of growth may be the same. The large volume of capital that has been accumulated permits a bigger " downward displacement " of the floor, and imposes a greater " drag " on new investment decisions. Depressions may also be deeper, and booms weaker as a result of a lower multiplier (higher marginal propensity to save). Also, the rate of growth is slow but accelerating in phase A, and is slow and decelerating in phase D.

Thus the impact of the trend on the pattern of economic fluctuations *aggravates* the inflationary and deflationary gaps arising from trend factors alone. In the neighbourhood of the inflection point, in the late B and early C phases, a chronic inflationary gap will appear, through the impact of long-run factors, quite apart from the cycle. The expansion of growth factors is high, calling for high levels of investment, while national income is not yet very high, so that savings tend to lag behind. This *chronic* inflationary gap

is widened by *cycles* with strong, long booms and short, shallow depressions. The inflationary gap ($Y_h - O_p$) may be substantial.

In phase D, on the other hand—the " mature economy "—there is a chronic and growing deflationary gap, as a result of trend factors alone. Income and savings are high, but the rate of growth, and autonomous investment, are low. These factors, if not offset, would in themselves create a growing gap between actual and potential national income. However, this gap is accentuated by the effect on the pattern of cycles of the slackening rate of growth; the upswings become more " disappointing," to use Schumpeter's term, while depressions become more devastating. Given a cycle of the Hicks type, " increasing underemployment " will occur in phase D, quite apart from the growing gap between the *trend* of investment and the *trend* of *ex ante* savings. Indeed, so long as *either* the ceiling or the floor follows the normal growth curve, the Hansen thesis will be substantiated, through the effect of the declining rate of growth on cyclical behaviour alone. Given the combined effects of flattening ceiling and floor, capital accumulation and rising national income, on the *cycle*, as well as the gap produced by the *trend* factors alone, increasing underemployment in phase D is inevitable, unless appropriate policies are pursued.

III

Let us now apply this analysis to the great depression of the 1930s in the United States. The critics of the Hansen " stagnation " thesis make two main points: first, they contend that growth can be maintained by technological progress alone; second, they point out that population growth declined, and frontier expansion ended, well before 1929. I shall show that the timing of these factors, far from destroying the Hansen thesis, actually fortifies it.

In Fig. 2 $I_{\dot{L}}$ shows investment based on the actual trend of population growth. It will approximate a normal growth curve, with a peak in 1925. (We shall for the moment ignore the post-Second World War increase in population growth.) Curve $I_{\dot{K}}$ shows investment based on rate of resource discovery. No statistics of discovery of new natural resources exist, but the Bureau of the Census does publish figures of the centroid of population. The westward movement of this centroid is a fair indication of the rate at which the " frontier " was opened up in the United States, and this in turn approximated closely the rate of resource discovery in the relevant sense. As Professor Hansen has rightly insisted, the influence of movement to new territory is not only a matter of discovering and opening up new agricultural land and new mineral resources; it is also a matter of " frontier spirit." This curve also approximates closely a normal " growth " curve, with its peak about 1880.

Adding these two curves together, we get a curve of autonomous investment which, depending on the relative strength of $\partial\phi/d\dot{L}$ and $\partial\phi/d\dot{K}$, will reach its peak somewhere between 1880 and 1925, and probably about 1910.

The curve of O_A, representing the real income produced by autonomous investment and the super-multiplier, will reach a peak at about the same time. If technological progress proceeds at a constant rate, and if the super-multiplier does not change, the peak of O_A will, of course, coincide with the peak of I_A. Because of the offsetting effects of economic growth on multiplier and accelerator, no marked trend in the super-multiplier need be expected. As for the rate of technological progress, we have assumed that it is constant. Considering how rapid technological progress was during the eighteenth and nineteenth centuries, it seems unlikely that the *rate* of technological improvement could have continued to rise steadily since. There is also some evidence that innovation is increasingly capital-saving. Thus there is good reason to suppose that the autonomous investment arising from technological progress also tapered off in recent decades. However, we do not need this argument to make our case, and accordingly we shall assume that I_T is a straight line. In the absence of evidence to the contrary, we could also assume that the net effect of any increase in replacement needs, and of the " drag " imposed by capital accumulation, is to reduce the flow of investment decisions; but this assumption, also, is not necessary to prove our hypothesis.

Now let us consider Hansen's argument that the presence of " stagnation " (or " increasing under-employment," as I prefer to term it) since, say, 1910 was part of the reason for the peculiar depth and duration of the " great depression " of the 1930s. The *trend* of savings was undoubtedly upwards throughout the whole period under consideration, following the upward trend of national income. In particular, the trend of savings out of the full-employment income was upwards following the trend in full-employment income. In this connection, it is important to note that the relevant savings trend is the trend of *ex ante* savings at full employment, and figures of *ex post* savings, which are, of course, identical with *ex post* investment, are quite irrelevant. Since autonomous investment began to fall after, say 1910, while *ex ante* savings continued to rise, " stagnation," or increasing under-employment, as a *trend* factor must have begun at about that time.

But if " stagnation " began in, say, 1910, why didn't it show up before 1930? I would argue that it *did* show up; the boom of the 1920s succeeded in establishing full employment only in the best months of 1929. The relationship between the trend and the cyclical movement is illustrated in Fig. 2. The downswing of 1913–14 was quite sharp; my own guess is that the " great depression " might have started then, if the First World War had not come along, which not only brought temporary prosperity, but built up a backlog of replacement demand, and accelerated the automobile, aircraft and chemical Kondratieffs. The backlog of housing demand was particularly important, although it tapered off with the decline in population growth after 1925. But because of the underlying gap between the *trend* of investment and the *trend* of *ex ante* savings at full employment, these strong, expansionary, cyclical factors failed to create inflationary conditions; prices sagged and full employment was reached only at the peak. Only with the weakening

of the *cyclical* factors towards the end of 1929 did " stagnation " reveal itself. Thus the historical course of national income between 1910 and 1940 was perfectly consistent with Hansen's thesis, as reinterpreted here. The lag between the onset of " stagnation," perhaps prior to the First World War, and its becoming effective as a factor governing the cycle, far from being a disproof of the Hansen thesis, is, in the light of the above analysis, one of its most persuasive empirical bulwarks.

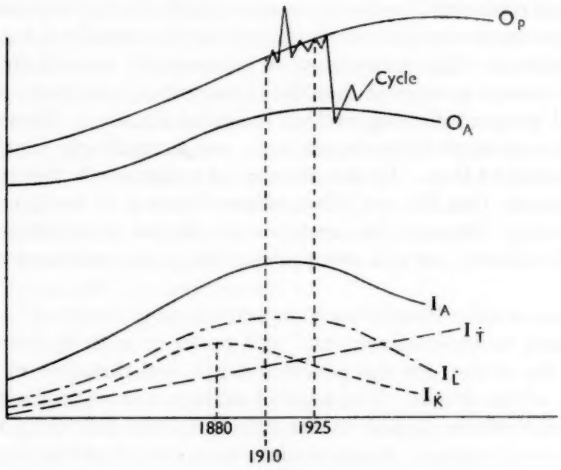

FIG. 2

A sharp break in trend could in itself cause a downswing, through the decline in the rate of increase in output that it entails. Of course, a *sharp* break in trend is unlikely; but if the effects of the changing trend are delayed the result may be the same. And it appears that this sequence of events actually occurred. The inflection point in both the potential and the autonomous trends probably came between 1910 and 1920; but the effects of the change in trend were delayed by the war and the secondary post-war boom. By 1930 the drop in the potential and autonomous rates of growth was probably substantial; an unusually deep and long depression was to be expected.

As for the " disappointing Juglar," there are several reasons for expecting a weak boom after so long and so deep a depression. One is Hicks' " transformation of the accelerator " (see especially p. 106 of his essay). A second is the increased effect of Marrama's " rationality factor." [1] In a depression as deep and as long as that of the 1930s, especially one with its peculiar configuration, with a brief recovery in 1934 and 1937, the " wait-and-see "

[1] V. Marrama, " Short Notes on a Model of the Trade Cycle," *The Review of Economic Studies*, Vol. XIV (I), pp. 34–40.

attitude common to long depressions would become still more deeply entrenched. Finally, the accumulation of debt during the depression resulted in a high marginal propensity to save in the upswing, and consequently a lower multiplier.

There were, of course, other factors involved in the " great depression " besides those analysed here. The financial crisis of 1931–33, which was partly the result of purely institutional weaknesses, the psychological impact of the breakdown of the gold standard, " technological stagnation " in the United Kingdom, and the still greater degree of " maturity " on the continent of Europe, where population growth and resource discovery had virtually disappeared in some countries, accentuated the depth of the world depression, which, of course, had some impact on the United States. Nevertheless, it appears that the interaction of cycle and trend, with the factors stressed by Hansen given pride of place in explaining the trend, and with a theory of fluctuations along Hicksian lines, provides a neat explanation of the " great depression."

The post-Second World War experience, far from being a contradiction of the Hansen thesis, as some critics have maintained, provides further corroboration of it. We are again at a fairly high cyclical level, perhaps again a conjuncture of Juglar and Kondratieff upswings (although I would not expect the Kondratieff to be very strong, since there seem to be no new industries that are heavily capital-absorbing) bolstered by a very high rate of government expenditures. Indeed, despite levels of government spending far in excess of the deflationary gaps predicted by the most " pessimistic " of the " pessimists," the post-war period has shown *deflationary* tendencies, interrupted by the inflationary spurt after the abolition of price controls, and by the Korean War. Levels of government spending much higher than were suggested by Professor Hansen, myself and others of " stagnationist " bent did not prevent serious unemployment from appearing in 1949, and again in 1953 and 1954. With government cash payments still running at a rate of about $90 billion per year, as compared to a gross national income in 1933 of $56 billion, the bogey to-day is again unemployment, not inflation.

The relatively high levels of employment since the war can be easily explained in terms of our analysis. First, the rate of population growth has been temporarily accelerated. Second, following Dr. Hicks, we might add government investment, including investment in military equipment, to " autonomous investment," as investment not a positive function of the level and rate of increase in output. The higher rates of population growth and government investment could well change the curve of autonomous investment from convex to concave upwards; for the time being, the American economy has reverted to phase B. Vigorous booms and mild depressions are to be expected. But there is no reason to suppose that the current rate in population growth represents a break in trend; it is more likely to be a temporary reaction to delayed family formation during the great depression and the war, combined with general prosperity. If the rate of population growth tapers off again in future, and if at the same time " peace breaks out,"

the maintenance of full employment and " steady growth " will require more vigorous policy measures than anything yet imagined. In general, these measures must consist either of large-scale redistribution of income from savers to spenders, or of a growing rate of government spending. If there are limits to the first type of policy—as I suspect—and government spending must grow, would not development of underdeveloped areas be an admirable way for Americans to help themselves by helping others?

IV

Let us now compare the conditions in phase A of our model with conditions actually existing in underdeveloped areas. We are here on less firm ground, since our knowledge of economic behaviour in underdeveloped areas is even less complete than it is for advanced countries.

Clearly, a trade-cycle model of the Hicks type will be applicable only to the monetary sector of underdeveloped areas, and will apply only to fluctuations generated from the demand side. My own impression is that the monetary sector covers the larger share of income and employment in most underdeveloped areas. From what I have seen of these countries, there are very few people entirely outside the market or money economy, whose output and spending is completely unaffected by the flow of money income. Moreover, while endogenous fluctuations of private investment are small, in many of these countries fluctuations in exports are sizeable. The impact of fluctuations in exports is much the same as fluctuations in private investment. The fluctuations in exports, and the consequent fluctuations in the income generated by them, appear to be substantial (in *percentage* terms) in a good many of the underdeveloped countries. There are at least three reasons why the *absolute* amplitude of fluctuations in underdeveloped countries would be expected to be lower than in advanced ones: the absolute size of the *multiplicand* is smaller; the stock of capital (and consequently the possible downward displacement of the accelerator) is smaller; and the structure of production being less complex, the accelerator itself may be smaller.

Models of the Hicks type obviously do not apply to cycles generated from the supply side, such as those resulting from weather cycles. Cycles in arid countries can be much greater in amplitude, so far as employment and unemployment is concerned, than the fluctuations common to advanced countries. Employment can vary from full employment in the peak season of a high rainfall year to 80% unemployment in the off-season of a drought year. This sort of fluctuation needs a different kind of analysis, and the discarded theories of Jevons and Moore may be worth re-examining in this connection.

With respect to the trend, the model may need a number of modifications to deal satisfactorily with underdeveloped areas. The equation for autonomous investment given above is taken over from my earlier article on " The Theory of Increasing Underemployment," [1] which was specifically designed

[1] Economic Journal, June 1950 (*op. cit.*).

to provide a rigorous statement of the Hansen thesis with regard to mature economies. In this article I considered it safe to ignore the effects of any downward *trend* in interest rates on both savings and investment, partly because "with interest rates as low as they already are, further declines will encounter more and more resistance." However, in underdeveloped countries, where effective interest rates are sometimes extremely high, a downward trend in interest rates is by no means inconceivable. I doubt whether falling interest rates would influence savings very much; but it is possible that falling interest rates would provide additional impetus to investment.

Second, in the above model we have ignored any impact on savings of a declining rate of time-preference. As Harrod has pointed out, increasing levels of education and foresight may result in greater interest in providing for the future, so that the propensity to save may increase as time goes by.

Third, there may be an upward trend in the super-multiplier. Once industrialisation begins and new consumers goods begin to appear on the markets of underdeveloped countries, at prices which put them within the range of the rising incomes of masses of the people, the "demonstration effect," or "spirit of emulation," may become stronger and multiplier effects greater. I am inclined to discount this factor, for some of the underdeveloped countries at least, because the "demonstration effect," and the marginal propensity to consume—particularly the marginal propensity to consume semi-luxury goods which are now imported—already seems very high.

Fourth, $\partial\phi/dt$ may be significant in phase A for some of the now underdeveloped countries. With improvements in objective and subjective security, and greater political stability, the reaction of investors to a *given* rate of technological progress or resource discovery may become stronger.

My own hunch, however, is that none of these modifications would be quantitatively significant. Much more important is the sharp contrast in the effects of population growth, under conditions in which population is kept continuously below optimum because development starts with a low population base, as it did in the now advanced countries, and its effects where development starts with population far above optimum. Where increases in population bring increases in *per capita* output, merely because labour is a relatively scarce factor, population growth has a favourable effect on investment in a number of ways. The increase in scale of the economy, and growth of the market, not only provides increasing demand for housing, transport facilities, public utilities and the like, but permits the use of better and already known techniques. (The selection of better techniques from among those that are already known should be not confused with technological progress, viz., the introduction of superior but hitherto unknown techniques.) It also means that optimal proportions can be maintained between labour and other factors of production, particularly capital, as capital accumulates. However, where populations are already above optimum levels, where lack of savings rather than lack of effective demand limits investment, and where an addition to the labour supply would lower *per*

capita output and income even if the additional workers were fully employed, population growth is a drag on economic development. It may prevent an increase in *per capita* income from taking place, or even lower *per capita* income, thus aggravating the difficulty of saving (and investing) enough to generate expansion.

Two other points regarding the impact of population growth in underdeveloped countries have been covered in another paper,[1] and can only be referred to here. The first of these is what I have called " the population multiplier." The essential argument is that if the initial increase in *per capita* income through industrialisation calls forth a certain increase in population which can find employment only in agriculture, so that the increased agricultural population resulting from an increase in industrial investment is constant, industrialisation will not raise the ratio of industrial to total population. The other point requires a lengthy and somewhat intricate analysis to demonstrate, but is intuitively acceptable.[2] If the ratio of labour supply to capital supply is very high; if the economy is divided into a capital-intensive sector (industry, plantation agriculture) with relatively fixed technical coefficients, and a labour-intensive sector with variable coefficients (agriculture); then structural unemployment of labour is almost certain to appear, and cannot always be removed by wage–price adjustments alone. This redundance of labour is itself a drag on further growth, since it mitigates against new investment in capital-intensive projects. Under these conditions, population growth is more likely to add to disguised unemployment than to output. For these reasons, when we come to an analysis of present underdeveloped areas, it seems necessary to delete the $\dot{L}$ from our autonomous investment function. Our simplified investment equation would then look like this:

$$I_A = \phi(\dot{K}, \dot{T})$$

In general, $\phi/dK \,.\, d^2K/dt^2$ will be lower in the present underdeveloped countries than it was in the advanced countries during the eighteenth and nineteenth centuries. There is little reason to suppose that the *rate* of discovery of new resources will rise significantly as compared with the last century. Few of the underdeveloped countries present the opportunity of moving from the now occupied areas to land *still richer* in agricultural and mineral resources, an opportunity that existed in the New World between, say, 1750 and 1890.

Moreover, for reasons already mentioned, there seems little reason for $\dot{T}$ to rise, except through the planned introduction into the backward sector of underdeveloped economies of techniques that are already well known in advanced countries. It is here that the greatest potential for growth lies in underdeveloped countries, and during the " catching up period " the rate of growth may indeed be considerably accelerated, given appropriate policies

[1] B. Higgins, " The ' Dualistic Theory ' of Underdeveloped Areas," *Ekonomi dan Keuangan Indonesia*, February 1955.

[2] The analysis is presented at length in an article by Richard Eckhaus, to be published in the *American Economic Review* for September 1955.

in both underdeveloped and advanced countries. But for economic, sociological and political reasons, *without* such a policy $\dot{T}$ is likely to remain low.

Under these conditions, with $\dot{L}$ having a zero or negative influence, with $\dot{T}$ and $\dot{K}$ both low, and with the level of income also low, both savings and investment will be at a very low level, and the rate of expansion will be small. Under these conditions it is not strictly true that there is a *chronic* inflationary gap. Indeed, an argument could be made to the effect that these conditions will produce rather a chronic *deflationary* gap.[1]

It is true, however, that under these conditions any factor that brings a sudden increase in investment, in exports or in government expenditures generates inflationary expansion. With the introduction of a publicly-financed development programme, or a sudden increase in the rate of technological progress or of resource discovery, or translation of growing population into growing effective demand, an inflationary gap will immediately appear.

The same argument could be expressed in terms of the Harrod or Domar conditions for steady growth. In Harrod's terminology, any increase in the strength of the growth factors would mean that the "natural rate of growth," G_n (which in our terminology is dO_p/dt), will exceed the "warranted rate of growth," G_w. Moreover, the actual rate of growth, G, will exceed G_w, and therefore the actual stock of capital, C, will be less than the required stock of capital, C_r, leading to further investment, a bigger excess of G over G_w, and chronic inflation. In terms of Domar's equation, ($dI/I = \lambda\delta$, where I is investment, $\lambda = dS/d\Upsilon$ in our terminology, and $\delta = dO_p/dI$) an increase in growth factors means that $\partial I/I$ is greater than $\lambda\delta$ so that chronic inflation appears.

One other interesting corollary arises from use of the Harrod equation. Since underdeveloped countries have substantial rates of population growth, with no accompanying increase in effective demand, it means, in Harrod's terms, that G_n is greater than G_w. If G_w is greater than or equal to G, so that C is greater than or equal to C_r, growing chronic unemployment must result.

In passing, we might note that the model also fits the British or American economies during their periods of vigorous growth. Between, say, 1840 and

[1] Let us write $\Upsilon_1 - \Upsilon_0 = I_1 - S_1$

$= I_1(\dot{L}, \dot{T}, \dot{K}, O/Q) - S_1(L, K, T, Q)$

$O_1 - O_0 = O(L, K, T, Q)_1 - O(L, K, T, Q)_0$

$P_1 - P_0 = \Upsilon_1/O_1 - \Upsilon_0/O_0$

In phase A, $\dot{L}$ is fairly high, but $I/\dot{L} = < 0$

$\dot{T}$ is low

$\dot{K}$ is low

O/Q is negligible

L is high

K is fairly high (in some countries)

T is low

Q is low

Thus, I_1 is low. S_1 may be fairly high, given unequal distribution of income. $O_1 - O_0$ is low, but still > 0. Thus $\Upsilon_1/O_1 - \Upsilon_0/O_0$ may be < 0.

1913, cycles in output and employment were mild, and took place around an historical trend that stayed close to the full employment trend.[1]

V. Summary and Conclusions

The above analysis is very far from being an exhaustive exposition of possible inter-relations between cycles and trends. It is not difficult, however, to discern from this analysis the directions in which it could be complicated or varied. I have experimented with some of the more obvious variations and complications, and I have not found that they alter fundamentally the conclusions already reached.

First, a model which relies on the Hicks theory of cycles is subject to any imperfections inherent in that theory; and the impact of the trend on the pattern of cycles is less apparent when other cycle theories are used. In Kalecki's theory, for example, the full-employment ceiling is less strategic; expansion can continue " through " the ceiling in an inflationary boom in which profits continue to rise at an increasing rate. There is no modern theory, however, in which investment is not dependent in some way on the rate of overall expansion of the economy, whether expressed in terms of income, sales, profits or output. There is, accordingly, no theory in which cyclical patterns are wholly independent of the underlying trend. Moreover, my choice of the Hicks model to demonstrate my argument was not dictated solely by its convenience for my purpose. *Employment* must depend on the rate of *physical* expansion; and the rate of *physical* expansion must be affected by the slopes of Hicks' ceiling and floor.

Second, it would be possible to treat autonomous and induced investment together, lumping all factors influencing total investment together in one equation, *e.g.*, $I = I_i(\dot{O}) + I_A(\dot{L},\dot{K},\dot{T}) - \psi(Q)$, where I_i is induced investment. However, the rate of increase in output will itself depend on growth factors, except that the current increase in output will depend on the expansion of population and resources in actual *employment*, and the rate at which improved techniques are actually *applied*, and not on the rate at which these factors become *known* and *available*. Let us lump together the expansion of growth factors *available* ($\dot{L}$, $\dot{K}$, $\dot{T}$) as G, and the rate at which they are actually utilised as G'. Then our equation becomes: $I = I_i(G', Q) + I_A(G) - \psi(Q)$. Clearly, G' reaches a ceiling at full employment, and total investment must fall at that point unless long-run growth accelerates sufficiently, or unless expansion takes place continuously along the full-employment ceiling, as in a " steady-growth " model. Such a formulation has some attractions in terms of neatness, but does not alter the conclusions.

Third, account should be taken of the possibility that the growth factors themselves may show a cyclical pattern, with changes in rates big enough to bring the accelerator into play. Personally, I doubt whether cycles in population growth would take place apart from major " shocks," such as

[1] The British " great depression " of 1825–45 was a special affair, best described in short compass as a " secondary post-war depression." The " great depression " of the 1870s and 1880s was no depression at all; output expanded almost continuously throughout the period.

wars; but resource discovery and technological progress may come in waves. However, this possibility introduces no serious new problems. The curves in Fig. 1 would then relate to a long wave, or "Kondratieff" cycle, and the pattern of the Juglar will depend on the phase of the Kondratieff. In this case, however, we need another concept of "trend"—a movement over periods longer than the Kondratieff. Why should this trend be a rising one? The *trend* of potential output, O_p, will be upwards so long as the *trend* of $d/dt\{T \cdot f(L,K,Q)\} > 0$. *If* successive booms are launched so that full employment is reached periodically, the *peaks* will be higher and higher. Whether or not this will happen will depend on the whole complex of very long-run trend, Kondratieff, and Juglar. There is room for much more work here.

However, none of these complications seems to destroy the major conclusions already reached:

1. There is a two-way relationship between cycles and trends, the one amplifying the other. An underlying rapid growth brings vigorous and prolonged booms, short and shallow depressions, so that the *actual* trend of real income stays close to the potential trend of real income at full employment—and vice versa.

2. If population increase and resource discovery follow growth curves, while technological progress is, more or less, constant, the economy will pass through four phases of economic development:

(*a*) Where autonomous growth is small but increasing. In this phase there will be a substantial gap between the autonomous and potential trends of real income, first growing and then diminishing. Booms will be weak but strengthening, depression severe but ameliorating. The cyclical factor will widen the gap between potential and historical trends of income at the beginning of the phase, narrow it towards the end. There may be a downward price trend as well during the early part of this phase.

(*b*) Where autonomous growth is rapid and increasing. The gap between income produced by autonomous investment alone and potential income will narrow. Booms will be long and vigorous, depressions sharp and shallow. Thus the trend of historical real income will approximate the trend of potential real income. The price trend will be upwards; there may be a "chronic inflationary gap."

(*c*) Where autonomous growth is rapid but decreasing. Income produced by autonomous investment will fall farther and farther below potential real income. Booms will weaken, depressions deepen and lengthen. The historical trend of real income will also, therefore, fall farther below the trend of full-employment income.

(*d*) Where autonomous growth is small and diminishing. Real income produced by autonomous investment will fall far below the full-employment level. Booms will be weak and short, depressions long and deep. Because of the greater "downward displacement" of the

floor, depressions will be longer and deeper in this phase than with the same autonomous rate of growth in phase A. In the absence of appropriate government action, the trend of historical real income will fall far and increasingly below the full-employment level. Prices will also show a downward trend.

3. This kind of interaction between cycle and trend helps to explain the peculiar depth and duration of the " great depression " of the 1930s in the United States. Resource discovery (frontier development) reached its peak around 1880, population growth in 1925. The delayed effect of the slackening of growth, due to the First World War and its aftermath, only intensified its impact.

4. The model for phase A, with some modification (especially as regards population growth), appears to fit general conditions in many underdeveloped areas to-day. Where cycles are generated from the supply side, the model does not fit. But where fluctuations are generated by variations in exports, and modifications are made to take care of special institutional factors, the model is not inconsistent with observed fluctuations.

In sum, the model seems to suggest a fruitful approach to a generalised theory of economic development, which would take account of both cyclical and trend factors.

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STABILITY AND GROWTH[1]

"The length of the unit period is of secondary importance: the shorter it is, the greater the number of periods involved, but the smaller the growth factor."—A. Kervyn in *The Review of Economic Studies*, 1954–55, Vol. XXII (1), No. 57, p. 65.

1. Introduction

The static determination of national output usually assumes all investment to be autonomous: a constant volume of investment expenditure, irrespective of the level of national output, is added vertically to the consumption function resulting in an aggregate demand curve whose slope is the marginal propensity to consume. Since the latter is less than one, the aggregate demand curve will run above a 45° line for outputs less than equilibrium output, below it for outputs in excess of equilibrium output. Thus, in technical parlance, the national output equilibrium is a stable one.

Modern dynamic models of the Harrod–Domar type have relaxed the assumption of autonomous investment. An equilibrium proportionate rate of growth is found, but the equilibrium path is unstable. On p. 86 of *Towards A Dynamic Economics* Harrod assures us that "this kind of instability has nothing to do with the effect of lags, and strikes me as more fundamental." No dissenters from this view are known to the present writer. The purpose of this paper is to show that while the length of the time unit is certainly of no importance for the equilibrium path *per se*, it is of the utmost importance for the consequences of deviations from that path, and thus for stability.

2. The Equilibrium Rate of Growth

First, let us sketch the simplest possible version of the current theory of growth. Our model has five variables in it, *i.e.*,

C = real consumption demand,
g = the proportionate rate of growth of net real national output,
I = net real investment demand,
S = real capital stock,
Y = net real national output.

In any growth model the variables will have to be dated, and we shall use the parenthesis (t) to indicate that a flow variable refers to the period t, and that a stock variable refers to the *end* of period t. To determine our five variables we must write down five equations. The easiest equations are the definitional ones, and there are two such equations.

[1] To Marianne Ferber (Illinois), Milton Friedman (Chicago), Robert A. Gordon (California) and Franco Modigliani (Carnegie), who have read an earlier draft of the present paper, the writer expresses his sincere thanks.

The first definitional equation defines the rate of growth of net real national output:

$$Y(t) = (1 + g)Y(t - 1) \tag{1}$$

The second definitional equation defines net real investment. Current net real investment, of course, is the net increase of real capital stock over the current period:

$$I(t) = S(t) - S(t - 1) \tag{2}$$

Next, let us turn to the behaviour equations of which there are two, *i.e.*, one which governs consumption demand, and one which governs invest-

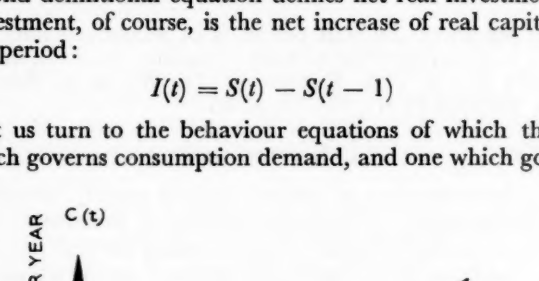

FIG. 1

ment demand. The former says that current consumption demand is a function of current net real national output:

$$C(t) = A(t) + aY(t) \tag{3a}$$

where A and a are parameters. $A(t)$ is the autonomous term of the consumption function, and it is reasonable to assume that the value of this term is rising over time at the same proportionate rate of growth as equilibrium net real national output:

$$A(t) = (1 + g)A(t - 1) \tag{3b}$$

In the consumption function, the parameter a is the marginal propensity to consume. The entire function is shown in Fig. 1. The aggregation problem involved is not too serious, since households do not buy from one another.

Business firms, however, do buy from one another, and our second behaviour equation, the investment demand equation, should therefore be

developed a little more carefully.[1] To play safe let us start at the sector level, and let there be as many sectors as there are products, each sector producing only one product. Thus no sector produces the plant and equipment inputs used by itself, all such inputs are purchased from other sectors. Let the physical output of sector j be Y_j. Let sector j use the product of sector i as capital stock, and let S_{ij} be the physical capital stock of goods produced by sector i and held by sector j. Let I_{ij} be the net increase in physical capital stock of goods produced by sector i and demanded by sector j. Let b_{ij} be the capital coefficient of sector j with respect to sector i. Now let sector j always try to establish a physical capital stock at the end of the current period which is in direct proportion to its current physical output. Then $S_{ij}(t) = b_{ij}Y_j(t)$, and $S_{ij}(t-1) = b_{ij}Y_j(t-1)$. Deduct the latter equation from the former and get

$$I_{ij}(t) = b_{ij}[Y_j(t) - Y_j(t-1)] \tag{4a}$$

which determines current physical net investment demand by sector j from sector i as a function of the change of sector j's current physical output.

Now for the aggregation. Multiply all physical outputs and all physical capital stocks by their respective money values deflated for price changes. Add all outputs thus multiplied on the one hand, and all capital stock thus multiplied on the other, divide the latter by the former and get the aggregate capital coefficient. If all the inter-sector physical capital coefficients remain constant, if all the deflated money values remain constant and if the relative importance of sectors remains constant, then the aggregate capital coefficient also remains constant. If it does, then we can draw Fig. 2 showing the aggregate function $S(t) = bY(t)$. Also we have $S(t-1) = bY(t-1)$; deduct the latter from the former and get the aggregate investment demand function:

$$I(t) = b[Y(t) - Y(t-1)] \tag{4b}$$

which determines current aggregate net real investment demand as a function of the change of current net real national output.[2] Thus current aggregate net real investment demand is in direct proportion to the excess of *current* net real national output over and above *last* period's net real national output. Graphically, for the current period the investment demand function is a straight line whose slope is the capital coefficient b, rising from the point of the output axis that indicates *last* period's net real national output. This is shown in Fig. 3.

Having now finished our definitional equations as well as our behaviour equations, we shall write down our equilibrium condition. For the system

[1] We are doing this mainly because an investment demand function like ours has very recently been severely criticised by Warren L. Smith, "Professor Gurley on Fiscal Policy in a Growing Economy," *The Journal of Political Economy*, Vol. LXII, No. 5 (October 1954), pp. 440–1. Smith failed to distinguish between investment demand and investment output and therefore erroneously accused Gurley of ignoring the output lag.

[2] If this distinction between investment demand and investment output is borne in mind, no circular reasoning is involved somewhat along these lines: current investment output, which is part of aggregate output, is a function of current aggregate output and thus partly a function of itself!

to be in equilibrium there must be no unintentional accumulation or depletion of inventory. This requires that aggregate demand, which is equal to

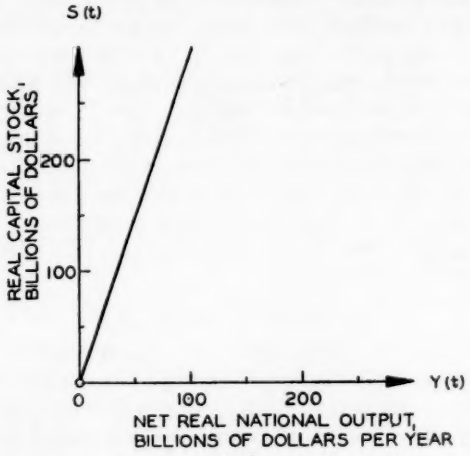

FIG. 2

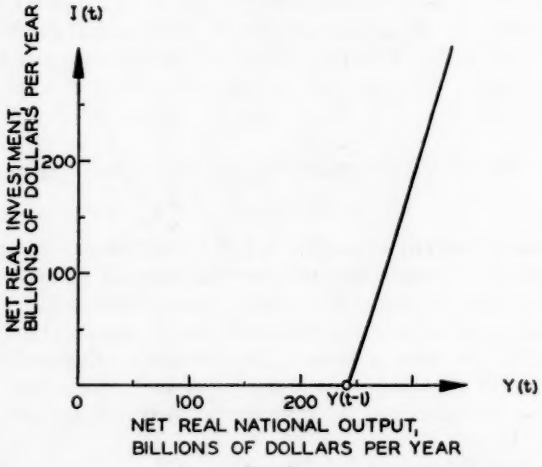

FIG. 3

the sum of consumption demand and investment demand, must be exactly equal to current net national output:

$$Y(t) = C(t) + I(t) \tag{5}$$

To solve graphically for current equilibrium output all we have to do now is to consolidate the consumption function and the investment function. Fig. 4 shows the consolidation, familiar from the text-book treatment of autonomous investment. Fig. 3's investment function has been superimposed vertically upon Fig. 1's consumption function, giving us the aggregate

demand function *CDE* in Fig. 4. In the familiar manner intersect aggregate demand *CDE* by a 45° line through zero expressing the equilibrium condition (5), and get the equilibrium current output $Y_0(t)$ in Fig. 4.

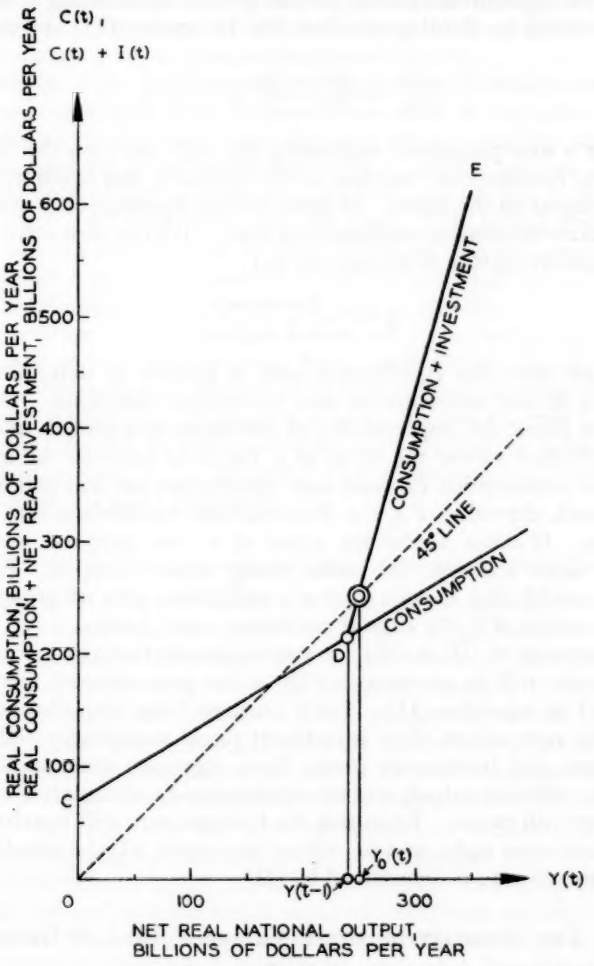

FIG. 4

Much more succinctly, the solution could, of course, be stated in algebraic terms. By inserting (3a) and (4b) into (5) and by using last period's net real national output as well as the autonomous term $A(t)$ of the consumption function for parameters, we can solve our system for current equilibrium net real national output. We get the following first-degree difference equation:

$$(I) \qquad Y(t) = \frac{A(t) - bY(t-1)}{1 - a - b}$$

This difference equation determines current equilibrium output in terms of past equilibrium output, and thus traces the path of equilibrium output over time. Rather than solving for the equilibrium path, we might wish to solve for the equilibrium rate of growth *per se*. In so doing it will be convenient to begin by dividing equation (3b) by equation (1) and denoting the result y:

$$\text{(3c)} \qquad \frac{A(t)}{Y(t)} = \frac{A(t-1)}{Y(t-1)} = \ldots = y$$

where y is a new parameter expressing the ratio between the autonomous terms of the consumption function on the one hand, and equilibrium net real national output on the other. It appears from equation (3c) that the value of this parameter remains constant over time. We can now solve our system for the equilibrium rate of growth and get:

$$\text{(II)} \qquad g = \frac{1 - a - y}{a + b + y - 1}$$

Here we have the equilibrium rate of growth as determined by the parameters of our consumption and investment functions. The familiar conclusions about the respectability of thriftiness in a growth model can be drawn. If *ceteris paribus* the value of y, the ratio between the autonomous term of the consumption function and equilibrium net real national output, were reduced, the value of g, the proportionate equilibrium rate of growth, would rise. If *ceteris paribus* the value of a, the marginal propensity to consume, were reduced, the same thing would happen. Finally, the economy would also have a higher equilibrium rate of growth if *ceteris paribus* the value of b, the capital coefficient, were lower.

The meaning of (II) is this. A system passing through successive stages of equilibrium will be growing steadily at the proportionate rate of growth determined by equation (II). For if business firms plan output to rise by this growth rate, adjust their investment plans accordingly and carry out their output and investment plans, then aggregate demand will exactly exhaust net national output, and no unintentional accumulation or depletion of inventory will occur. From this the business-man will conclude that his growth plans were right, and he will see no reason why he should revise his idea of a growth rate as determined by (II).

3. The Stability of the Equilibrium Rate of Growth

But what happens if the business-man suddenly starts planning for a growth rate different from the one determined by equation (II)? Suppose, for example, that up to now the system has been in equilibrium but that business firms now plan output to rise by a growth rate *higher* than the one determined by (II). Going back to Fig. 4, this means that while $Y(t-1)$ was period $t-1$'s equilibrium output, business-men do not now plan for output $Y_0(t)$ but for an output higher than that. In Fig. 4, for any output larger than $Y_0(t)$ the sum of consumption demand and investment demand

will exceed that output. Because of the high value of the slope of the aggregate demand curve $C(t) + I(t)$ used in Fig. 4, the aggregate demand curve now runs above the 45° line. But this means that inventories are depleted, and the business-man is likely to suspect that he did not expand his output enough. Therefore, he may well try to catch up in the subsequent period by planning for an even higher rate of growth.

Conversely, if the business-man suddenly starts planning output to rise by a growth rate *lower* than the one determined by equation (II). For outputs slightly lower than $Y_0(t)$ the sum of consumption demand and investment demand is less than that output. Again because of the high value of the slope of the aggregate demand curve used in Fig. 4, the aggregate demand curve now runs below the 45° line. This means that inventory piles up, and the business-man is likely to suspect that he has expanded his output too far. In the subsequent period he may well try to remedy this situation by planning for an even lower rate of growth.

To summarise: Once the system deviates from equilibrium it releases forces pulling it even farther away from equilibrium. In this sense it is unstable. What makes it unstable is the high value of the slope of the aggregate demand curve $C(t) + I(t)$ used in Fig. 4. In that diagram the marginal propensity to consume net national output is set equal to 0·6, while the capital coefficient is set equal to 3. Thus the slope of the aggregate demand curve beyond output $Y(t - 1)$ is equal to 3·6.

4. The Capital Coefficient and the Length of the Time Unit

At this point it becomes crucial that while the propensity to consume is a ratio between two flows, the capital coefficient is a ratio between a stock and a flow. If the length of the time unit used is changed, this does not affect the value of the propensity to consume, for the values of the numerator as well as the denominator are both in direct proportion to that length. But if the length of the time unit is changed, the numerator of the capital coefficient will not change, because it is a stock. The denominator will change, because it is a flow whose value is in direct proportion to the length of the time unit. Consequently, the value of the capital coefficient is in inverse proportion to the length of the time unit. For example, Kuznets [1] has found the ratio between the dollar value of fixed (viz., structures and durable equipment) capital and the dollar value of *annual* net national product to be close to 3. Thus on an annual basis the capital coefficient is 3, but on a quarterly basis it would obviously be 12, and on a decade-basis it would be 0·3.

5. Result

We have said that what made the equilibrium illustrated in Fig. 4 unstable is the high value of the slope of the aggregate demand curve. Fig. 4 was

[1] Simon Kuznets, "Long-term Changes in the National Income of the United States of America since 1870," *Income and Wealth of the United States*, edited by Simon Kuznets (Cambridge, England: Bowes & Bowes, 1952), Table 25, p. 127.

based on a capital coefficient equal to 3. If any realism is desired, this implies that the length of the time unit used is around one year. The time unit used is a business-planning period, and we said that business firms were assumed to try to establish a real capital stock at the end of the current period which was in direct proportion to current net real national output. So if the year is the time unit, the capital coefficient is equal to 3. But although little is known about the length of business-planning periods, we would suspect that the year is much too short for this purpose. Business hardly tries to adjust its stock of structures and durable equipment to its annual rate of output. So let us try a longer time unit. For example, what if we take the *decade* rather than the year as our time unit? Figs. 5 through 7

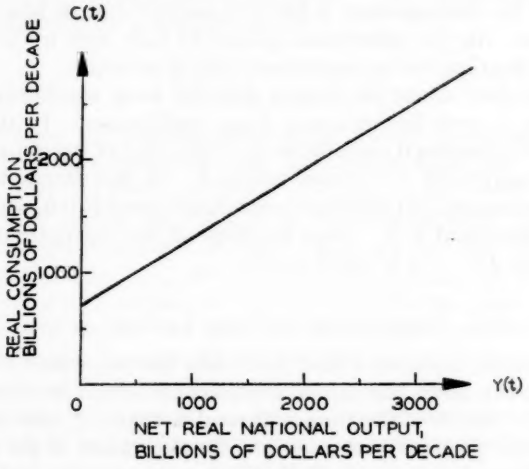

FIG. 5

show the consequences of this alteration. First, in the consumption function, shown in Fig. 5, one now has billions of dollars per decade rather than billions of dollars per year on both axes, and consequently there is no change in the slope of the consumption function. Second, in the capital stock–output function, shown in Fig. 6, one now has billions of dollars per decade on the output axis *but still just billions of dollars on the capital–stock axis*. Consequently, on a decade basis the capital coefficient is only slightly above one-tenth of its value on an annual basis, so we are now using a capital coefficient slightly above 0·3, or more precisely equal to 0·3556,[1] as shown in Fig. 6. The

[1] Not 0·3, mainly because of our habit of letting a stock variable refer to the *end* of the period. On an annual basis call the capital coefficient b_1, on a decade basis call it b_{10}. Find the value of end-of-period capital stock over the entire output of ten preceding years. Since output is growing at the annual rate g, we have:

$$b_{10} = b_1 \frac{1}{1 + (1+g)^{-1} + (1+g)^{-2} + \ldots + (1+g)^{-9}}$$

If $a = 0{\cdot}6$, $b_1 = 3{\cdot}0$ and $y = 0{\cdot}2846$, then according to (II) $g = 0{\cdot}04$ and $b_{10} = 0{\cdot}3556$.

investment function, as developed in equation (4b) but not shown separately, will have the same slope.

At this point the mathematical reader will have no difficulty. He will realise that in equation (4b) the variable on the left-hand side, $I(t)$, has the dimension dollars per unit of time, but the variable on the right-hand side, $Y(t) - Y(t-1)$, has the dimension dollars per unit of time *per unit of time*. Thus lengthening the time unit tenfold will lengthen the value of the former variable approximately tenfold but lengthen the value of the latter variable approximately hundredfold. To compensate for this, the parameter b will have to be reduced to approximately one-tenth of its former value.

The non-mathematical reader may need help in the form of a numerical

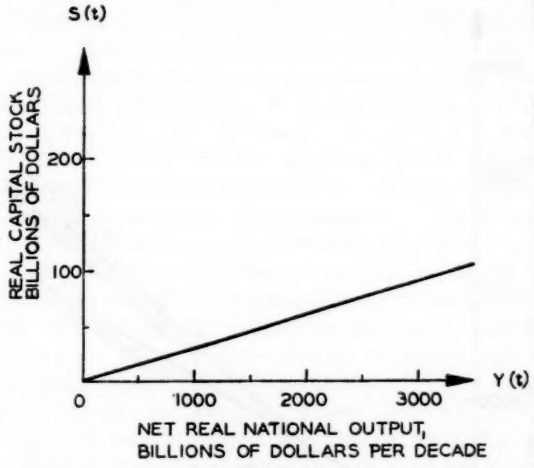

FIG. 6

example. In a given year let net real national output be \$100 billion. Let the annual capital coefficient be 3. Thus the required capital stock is \$300 billion. Let the economy grow by 4% per annum. Next year's net real national output is then \$104 billion, and required capital stock is \$312 billion. Required investment is then \$12 billion per annum, and output has increased by \$4 billion per annum per annum. The ratio between the two, which is the slope of the annual investment function, is 3.

Now let us look at the same economy on a decade basis. In a given decade, let output be \$1,000 billion. As explained in the footnote on p. 622, on a decade basis the capital coefficient is 0·3556, and the required capital stock is consequently \$355·6 billion. Now something which grows at 4% compounded annually will grow at 48% per decade. Next decade's output, then, is \$1,480 billion, and required capital stock is \$526·288 billion. Required investment is then \$170·688 per decade. Output has increased by \$480 per decade per decade. The ratio between them, which is the slope of the decade investment function, is 0·3556.

It is true, then, that the decade investment function has a slope which is approximately one-tenth of the slope of the annual investment function. And as a result of all this, the aggregate demand curve, shown in Fig. 7, now has a much lower slope over the relevant range, *i.e.*, slightly above 0·9 or more precisely 0·9556. Thus at outputs higher than the equilibrium output

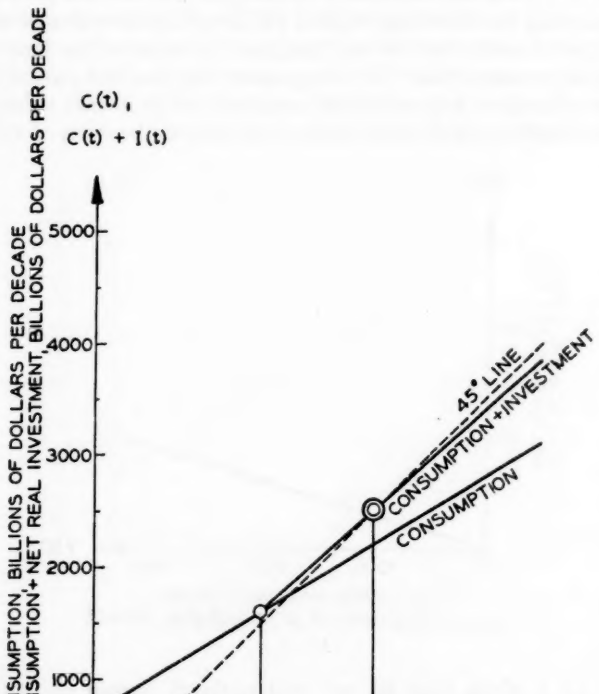

FIG. 7

the aggregate demand curve now runs below the 45° line. And at outputs slightly lower than the equilibrium output the aggregate demand curve now runs above the 45° line. Thus the equilibrium is now a stable one.

It might well seem baffling that anything as seemingly nominal as the length of the time unit used in the model could have much to do with something as real as the stability of a growing economy. But the length of the time unit is not nominal, after all. Ultimately the time unit is a planning

period, and if the induced-investment planning period is rather short, say one year, then the capital coefficient is rather high, say 3. Then if for any reason business firms plan current output to exceed current equilibrium output by $1 per year, they will immediately plan, carry out and complete, *before the year is over*, three extra dollars' worth of investment in equipment and fixed plant in order to maintain the rigidly fixed capital coefficient we are using. Furthermore, if the marginal propensity to consume net national output is 0·6, consumers will spend 0·6 extra dollars' worth annually on consumption. Thus every dollar's worth of deviation from annual equilibrium output will generate $3·6 worth of deviation (in the same direction) from annual equilibrium demand. As we have seen, this effect is a highly de-stabilising one.

If, on the other hand, the induced-investment planning period is rather long, say a decade, the capital coefficient is much smaller, *i.e.*, slightly above 0·3. This in itself, the reader should be warned, has no effect whatsoever upon the equilibrium path. If on an annual basis $a = 0{\cdot}6$, $b = 3{\cdot}0$ and $y = 0{\cdot}2846$, then solution (II) will render the value $g = 0{\cdot}04$ per annum. On a decade basis, a and y are still the same but b changes from 3·0 to 0·3556 (as explained in the footnote on p. 622). So on a decade basis, solution (II) will render the value $g = 0{\cdot}48$ per decade. This is as it should be, anything that grows smoothly at 4% per annum is known to grow by 48% per decade. But while the shift from an annual to a decade basis does not affect the equilibrium path *per se*, it does affect the consequences of deviations from that path. If firms plan current output to exceed current equilibrium output by $1 per year, which is equivalent to $10 per decade, then they will plan, carry out and complete, *before the decade is over*, 3·556 extra dollars' worth of investment in equipment and fixed plant. For the same capital stock handles ten times as much output per decade as it handles per year! Furthermore, if the marginal propensity to consume net national output is 0·6, consumers will spend six extra dollars' worth per decade on consumption. Thus every ten dollars' worth of deviation from decade equilibrium output will generate only 9·556 dollars' worth of deviation (in the same direction) from decade equilibrium demand. This is clearly a stabilising effect. Entrepreneurial growth expectations that are inconsistent with the equilibrium rate of growth, as defined by (II), may well tend to correct themselves automatically.

6. Conclusion

The instability of a growth model of the Harrod–Domar type can be made to shade over into stability by simply lengthening the time unit on which investment planning is based and thus continuously weakening the induced character of investment. Since unstable equilibria are rather uninteresting, the notion of an equilibrium rate of growth thus assumes new importance.

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SEQUENCE ANALYSIS AND THE THEORY OF THE RATE OF INTEREST[1]

FOR nearly twenty years now three apparently contradictory theories of the rate of interest have been propounded, and the protagonists and defenders of each theory have never, it would seem, been able to find any common ground for agreement. In the March issue of this JOURNAL Mr. Hahn[2] has subjected the contending claims to a searching analysis in an attempt to reconcile the various theories. His conclusions, however, are far from satisfying as he shows that the various theories do not all lead to the same results:[3] and although he attributes this to a stock-flow confusion, it is not really apparent that the discrepancies result from this. The aim of this article is not essentially to show that the analyses of the three main theories, viz., liquidity preference, loanable funds and savings-investment, can be reconciled, but, rather, to construct a more comprehensive comparative-statics model with a dynamic lag to explain a theory of the rate of interest. It will then be shown that the three theories are only particular cases of this more general model.

In the first place, a static lagless model for any given *single period of time* must be constructed.[4] The model presented here is based essentially on that of Professor Hicks.[5] A modified Keynesian model can be simply represented by a system of five equations

$$i = L(Y,M) \quad K = k(i) \quad S = s(Y) \quad S = K \quad Y = E + K \quad . \quad (1)$$

where i is the rate of interest; M is the quantity of money; Y is total income; K is the *demand for investible funds*; S is the *supply of investible funds*; and E is the expenditure on consumption goods.

The last four variables are best regarded as value magnitudes (*i.e.*, as the products of price and quantity) and not in real terms. This gives a more general approach, although it is not essentially Keynesian. Secondly, it is important to notice that these last four variables, Y, K, S and E, represent magnitudes for a period of time and can, therefore, be regarded as *flows*, while M is the *stock* of money in existence during the period. i is the rate of interest ruling during the period.

The first equation, which can be termed the money rate of interest function, tells us that the rate of interest for any period is determined by the

[1] I am indebted to Sir Dennis Robertson and to Mr. M. Gaskin of Glasgow University for the very helpful criticisms which they have given me in my efforts to develop the ideas contained in this article. I myself, of course, am entirely responsible for any errors which may yet be found in it.

[2] F. H. Hahn, "The Rate of Interest and General Equilibrium Analysis," ECONOMIC JOURNAL, LXV, 1955, pp. 52–66.

[3] See *ibid.*, p. 64.

[4] It is important to notice that there is no need to assume any kind of *equilibrium*.

[5] J. R. Hicks, "Mr. Keynes and the 'Classics'; a Suggested Interpretation," *Econometrica*, V, 1937, pp. 147–59.

level of income and the quantity of money in the same period: L_Y is positive and L_M negative. Professor Hicks[1] (and Dr. Lange,[2] as well as other writers) writes this equation as $M = L(Y,i)$. It seems more reasonable, however, to write i expressly as the dependent variable; the quantity of money then appears more logically as an independent datum of the system.

The second equation gives the demand for investible funds, *i.e.*, the demand for funds by entrepreneurs to undertake the construction of *new* investment goods.[3] k' is, of course, negative. Nobody can deny that depreciation and re-investment are also influenced by the rate of interest, but interest charges on these items are invariably reckoned as part of the costs of production excluding interest payments, and the funds meeting them, when averaged over the whole economy, can be thought to flow continuously from sales proceeds and not from the supply of investible funds.[4] The significance of the presence of investment, then, is that the economy is usually expanding. The third equation gives the supply of investible funds,[5] *i.e.*, it gives the schedule of the funds which are given by lenders to those who wish to undertake new investment. s', the marginal propensity to supply investible funds, is, of course, positive. This equation is usually regarded as the multiplier equation,[6] but in a lagged sequence analysis, as will be seen in a moment,[8] this way of looking at the matter is not altogether valid. The fourth equation states that for any period, be the system in equilibrium or not, the supply of investible funds equals the demand for investible funds—an obvious truism. The second and third equations, then, can be simply regarded as are ordinary supply and demand equations relating quantity demanded and supplied to price: and, just as in an ordinary commodity market, where quantity supplied equals quantity demanded, the supply of investible funds for any period equals the demand for investible funds in the *same* period. Even although the supply equals the demand, we are *not* estopped from using functional relationships in evaluating the relevant magnitudes.[7]

[1] Cf. J. R. Hicks, *Value and Capital* (Oxford, 1950), p. 153.

[2] See O. Lange, "The Rate of Interest and the Optimum Propensity to Consume," *Economica*, NS. V, 1938, p. 14.

[3] Cf. Professor Domar's definition of investment in an expanding economy: E. D. Domar, "Capital Expansion, Rate of Growth and Employment," *Econometrica*, XIV, 1946, p. 138.

[4] There is, of course, a great deal to be said for trying to distinguish between depreciation and new investment charges. If a newer type of machine replaces an older type when its life is finished, is (part of) the cost of the new machine to be regarded as new investment? Cf. I. Svennilson, *Growth and Stagnation in the European Economy* (Geneva, 1954), pp. 20–39. The difficulty is real and important but must be ignored here.

[5] I have deliberately used the term "supply of investible funds" in place of the ordinary term "saving." The reason for this peculiarity will be explained later: see infra, p. 637.

[6] Cf. J. R. Hicks, *loc. cit.*, p. 152, footnote 4. Cf. also R. F. Harrod, "Keynes and the Traditional Theory," *Econometrica*, V, 1937, p. 77: "[the multiplier] is merely a disguised form of the ordinary supply schedule for free capital, but with the level of income treated as a variable."

[7] See *infra*, p. 628.

[8] Cf. J. M. Keynes, "Alternative Theories of the Rate of Interest," ECONOMIC JOURNAL, XLVII, 1937, p. 249: "aggregate saving and investment, in the senses in which I have defined them, are necessarily equal in the same way in which the aggregate purchases of anything on the market are equal to the aggregate sales. But this does not mean that 'buying' and 'selling' are identical terms, and that the laws of supply and demand are meaningless."

The fifth equation, the income identity, states that the sum of the expenditure on consumption goods and on investment goods in any one period, whether the system is or is not in equilibrium, equals the income of the same period. We thus have five unknowns, E, K, S, Υ and i, one given datum, M, and five independent equations. The system is, therefore, determinate.

Instead, however, of using the fifth equation (the income identity) to determine E, the expenditure on consumption goods, the more usual consumption function equation

$$E = c(\Upsilon) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

could have been used. But the income identity must always hold, so that equation (2) cannot be regarded as an *independent* equation. Consequently, c', the marginal propensity to consume, must be determined by the other equations of the system. Since $dS = dK$, $dS = s'd\Upsilon$ and $d\Upsilon = dE + dK$, it follows that

$$d\Upsilon = (c' + s')d\Upsilon \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

so that $c' + s' = 1$.

Suppose, now, we introduce an income-lag into the equations of set (1). It is also logical to introduce a lag into the money effect. We then have

$$i_t = L_L(\Upsilon_{(t-1)}, M_{(t-1)}) \quad K_t = k(i_t) \quad S_t = s_L(\Upsilon_{(t-1)}) \quad K_t = S_t \quad \Upsilon_t = E_t + K_t \,. \quad (4)$$

where the t and $(t - 1)$ subscripts refer to the current and previous periods respectively.

From the equations of set (4) we can immediately find that

$$d\Upsilon_t = dE_t + s_L'd\Upsilon_{(t-1)} \quad . \quad . \quad . \quad . \quad . \quad (5)$$

where s_L' is the *lagged*[1] marginal propensity to supply investible funds. Now there is no longer any *a priori* given relationship between $d\Upsilon_{(t-1)}$—or $\Upsilon_{(t-1)}$—which can be regarded as given datum of the system, and $d\Upsilon_t$—or Υ_t—which is the variable we wish to determine. Consequently, dE_t cannot be determined from equation (5)—or E_t from the income identity of set (4). E_t can, however, be determined by a lagged income consumption function equation

$$E_t = c_L(\Upsilon_{(t-1)}) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

Using equation (6) we get

$$d\Upsilon_t = (c_L' + s_L')d\Upsilon_{(t-1)} \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

where c_L' is the *lagged* marginal propensity to consume. Equation (7) may be termed the lagged multiplier equation. Notice that current income can no longer be determined from only s_L' and $d\Upsilon_{(t-1)}$: c_L' must also be known to give a determinate result.[2] Lagging has a significance which is highly important.

A radical alteration has now been introduced into the system. Equation

[1] The point does require emphasis as is shown below.

[2] If, of course, it is given *a priori* that $(c_L' + s_L')$ is in fact unity, the value of one of the coefficients can always be determined from the other: see *infra*, p. 630. Cf. also O. Lange, "The Theory of the Multiplier," *Econometrica*, XI, 1943, pp. 227–45, and A. Smithies, "Keynesian Economics: the Propensity to Consume and the Multiplier. The Multiplier," *American Economic Review*, XXXVIII, 1948, Papers and Proceedings, pp. 299–305.

(6) is no longer a dependent equation, but has become an *independent* equation of the system, for, as has been seen, without it we could not determine dE_t and, therefore, dY_t—or E_t and Y_t. All this is perfectly familiar and has been analysed many times before; but what has not been pointed out, as far as I am aware, is the following vitally important fact. There are now *two* data, $M_{(t-1)}$ and $Y_{(t-1)}$, and there are still only *five* variables, E_t, S_t, K_t, Y_t and i_t; but there are now *six* independent equations. In other words, the system as it stands is overdeterminate. This overdeterminateness cannot, of course, be avoided by introducing another investment good: for with the introduction of every new type of investment good an additional rate of interest makes its appearance, so that with each pair of additional equations (supply of and demand for investible funds for the particular investment good) there is an additional pair of variables. Similarly, with each additional consumption good introduced an additional consumption function equation makes its appearance. The problem cannot be solved by "disaggregation," to use Ralph Turvey's term in this connection.[1]

Before analysing the problem, however, the exact interpretation of the differentials $dY_{(t-1)}$, dY_t, dE_t, dK_t and dS_t must be examined. It would be possible to define these differentials as *marginal* increases, *i.e.*, the value of any one of the variables in one period minus its value in the preceding period. Consequently, for example, dE_t would equal $E_t - E_{(t-1)}$. On such a definition, the value of c_L' would be in the neighbourhood of zero (either positive or negative) and not in the neighbourhood of unity. On the other hand, the differentials could be interpreted as *total* increases, *i.e.*, the value of any one of the variables in one period minus its value in some initial (equilibrium) period. Then dE_t would equal $E_t - E_0$, where E_0 depends on some initially given (equilibrium) conditions.[2] On this definition the value of c_L' would be in the neighbourhood of unity. Similar considerations, of course, apply to the other coefficients.[3] This latter definition of total increases has the obvious advantage in that the differentials so evaluated themselves measure the changes in the values of the variables from their respective equilibrium values: on the former definition the marginal increases must be summed to obtain such values. Further, the total definition is more in keeping with modern usage,[4] and will, therefore, be adopted throughout this analysis.

Suppose, then, that we have a single exogenous injection of income in

[1] See R. Turvey, "Some Notes on the Multiplier Theory," *American Economic Review*, XLIII, 1953, p. 257.

[2] Professor Machlup (see F. Machlup, *International Trade and the National Income Multiplier* (Philadelphia, 1943), p. 27) is one of the few economists to expressly refer to this problem. Cf. also P. A. Samuelson, "Dynamic Process Analysis," in *A Survey of Contemporary Economics*, H. S. Ellis, Ed., Philadelphia, 1949, p. 364. It is, despite its neglect, a very important one, more particularly in models where the multiplier and accelerator interact and an express definition of derivatives and differentials is needed for a consistent solution of the system.

[3] If, on the total definitions, c_L' is 0·9 and s_L' is zero, then c_L' will become −0·1 on the marginal definitions: in general, the sum of the coefficients (total) *minus* unity equals the sum of the coefficients (marginal).

[4] Cf., *e.g.*, Professor Hicks' analysis in his *Contribution to the Theory of the Trade Cycle* (Oxford, 1950), pp. 170 *et seq.*

period $(t-1)$, $d\Upsilon_{(t-1)}$. If $(c_L' + s_L')$ is unity the total increase in income in period t, $d\Upsilon_t$, equals $d\Upsilon_{(t-1)}$: in other words, income remains constant at its new level. The whole of the increase in the received income of period $(t-1)$, no more and no less, becomes expenditure, on both consumption and investment goods, in period t, so that the income of period t equals the income of period $(t-1)$. Now there are three sets of equalities here which must be clearly distinguished.

(1) The expenditure of period $(t-1)$ equals the income of period $(t-1)$. This is an identity—a truism—which must always hold.

(2) The expenditure of period t equals the income of period t. This, too, is an identity—or truism—which must always hold.

(3) The income ($\equiv$ expenditure) of period $(t-1)$ equals the expenditure ($\equiv$ income) of period t. This is *not* an identity, but merely an equality which holds because $(c_L' + s_L')$ is unity.

Now since the equations of types (1) and (2) are identities, Say's Law must *always* hold if it is applied to any *one* period. This can be termed the *timeless* interpretation of Say's Law, and is, in fact, operationally valueless. Hahn's criticism of Modigliani on this point [1] is, therefore, rather inconsistent, since he must assume that this timeless interpretation of Say's Law need not necessarily hold. For any period, the supply of and demand for every commodity, including money, are equal. There can be no *net* excess demand.[2] Dr. Lange [3] has clearly shown that, in a single period timeless analysis, the net excess demand for (supply of) all commodities equals the supply of (demand for) money. Professor Hicks' analysis of the "otiose equation" theory of the rate of interest [4] also emphasises this point.

Suppose, however, that we apply Say's Law to the relationship between the income ($\equiv$ expenditure) of period $(t-1)$ and the expenditure ($\equiv$ income) of period t; this may be termed the *sequence* interpretation of Say's Law. Obviously, if the expenditure of period t equals the income of period $(t-1)$, then Say's Law in its sequence interpretation holds. But, as we have seen, this is true only *if* $(c_L' + s_L')$ is unity. Suppose, then, that it is given that the sequence interpretation of Say's Law *always* holds, as, presumably, classical economics assumed. Then, referring baek to equation (5), $d\Upsilon_{(t-1)} = d\Upsilon_t$. dE_t is determined from equation (5) and equation (6) ceases to be an independent equation. The system is no longer overdeterminate and the classical (Walrasian) solution of general equilibrium (and of savings and investment and rate of interest) is valid *because we have*

[1] See F. H. Hahn, *loc. cit.*, p. 56.

[2] This, of course, must be interpreted as applying to the *whole* economy: it is a proposition in macro-economics (as is the whole of Hahn's analysis), not in micro-economics. Professor Goodwin's distinction between a micro-application and a macro-application of Say's Law, between Say's Law of the First Kind and Say's Law of the Second Kind as he terms it, is vitally important; but the problem must be ignored here: see R. M. Goodwin, "The Multiplier as Matrix," ECONOMIC JOURNAL, LIX, 1949, pp. 539–40.

[3] See O. Lange, *Price Flexibility and Employment* (Bloomington, Indiana, 1952), pp. 5–6.

[4] See J. R. Hicks, "Review of *The General Theory*," ECONOMIC JOURNAL, XLVI, 1936, pp. 245–6, and *idem*, *Value and Capital*, pp. 141–70. This theory is extremely important, and we will return to it later; see *infra*, pp. 632–3.

assumed that the WHOLE *of any exogenous injection of income in one period is completely absorbed by the system and spent in the next.* But we know that $(c_L' + s_L')$ need not be *identically* equal to unity,[1] so that Say's Law in its sequence interpretation need not *necessarily* hold. Our system, then, must still be regarded as overdeterminate.

One final point must be cleared up before attacking this problem of overdeterminateness. Where does the change in income come from if income is increasing, or go to if income is decreasing? Let us examine the case of falling income first, when some of the income of one period is not spent on either consumption or investment goods in the next period. Now no economist will dispute the fact that an *individual* can retain part of his received income from one period, say period $(t - 1)$, in the form of money in the next period, period t, by not spending it. In what other way could expenditure ($\equiv$ income) in period t be less than income ($\equiv$ expenditure) in period $(t - 1)$? It is quite legitimate to say that the individual is *hoarding* part of his received income of period $(t - 1)$ in the *next* period, period t. To say, of course, that an individual can hoard part of the income he receives in any period in the *same* period is nonsense: the expenditure of any period equals the income of the same period. In other words, the concept of hoarding can only be validly introduced into a sequence analysis. There is no reason, then, preventing the summation of the hoardings of all individuals [2] to arrive at the total hoarding of the whole economy. We can, therefore, equate the decrease in the income of any period to the hoarding of that period, and so arrive at a definition of hoarding. Most Keynesians refuse to take this final step of summation: they maintain that, although an *individual* can hoard, the *economy as a whole* cannot. In a timeless analysis, of course, the conception of hoarding cannot be applied to the whole economy: Say's Law in its timeless interpretation must hold. But then, as we have just seen, the individual cannot be conceived to hoard in a timeless analysis. Keynesians are just as wrong if they infer that the individual can hoard in a timeless analysis as they are if they infer that in a sequence analysis the whole economy cannot do so.

It follows, too, that in a sequence analysis it is no longer necessary to assume that hoards disappear. They exist as a personal *asset* in a bank or as a *stock* of money, taken out of the income *flow* but nonetheless real for all that. Again, of course, Keynesians immediately answer: the quantity of money is controlled by the banking system, so that the economy as a whole cannot increase its monetary holdings. It is obviously true that the whole economy cannot hold more money than the banking system creates, but this is *not* a pertinent criticism of the concept of hoarding advanced here. In a sequence

[1] The solution of equation (7) is $d\bar{Y}_t = d\bar{Y}_0(c_L' + s_L')^t$, assuming that both c_L' and s_L' are constant. Income will contract, remain stationary or expand according as $(c_L' + s_L') \lessgtr 1$. $(c_L' + s_L')$ can, of course, be greater than unity due to accelerator effects.

[2] Some individuals, of course, may be dishoarding (*i.e.*, spending in one period in excess of their received income of the previous period by running down previously accumulated hoards, by means of an inter-personal loan and/or by an extension of pure bank credit): but if income is decreasing then total *net* hoarding must be taking place.

model the money which can be hoarded by the community as a whole has been *previously* created by the banks: it is *already* in the hands of the whole community in the form of income. It is the action of the community as a whole with regard to the money which it *already* possesses that brings about a change in the holding of money, *i.e.*, in hoarding. Keynes himself has given currency to the phrase " a *mass* movement into cash." [1] This is a vitally important point which merits additional emphasis. *The banks cannot directly* [2] *control the amount of non-spending*, i.e., *hoarding, of the community as a whole, since the money out of which the hoarding can be made is already in the hands of the community in the form of income.* Consequently, to say that there is no more hoarding to hoard is to miss the point completely.

Finally, there is no *a priori* reason why $(c_L' + s_L')$ should not be greater than unity. The presence of an accelerator effect may well result in such an explosive situation developing. Such a condition has been termed by Professor Samuelson [3] one of " pure pump-priming." The additional expenditure is met from a depletion of previously accumulated hoards and/or an expansion in the quantity of money. Just as in the case of falling income, so here; we can quite legitimately say that the increase in the income of any period equals the dishoarding, or negative hoarding, of that same period.

If, then, the sequence interpretation of Say's Law does not necessarily hold, some other variable must be introduced into the system in order to remove its overdeterminateness. It is because the level of income is changing, *i.e.*, because either hoarding or dishoarding is occurring, that the system is overdeterminate, and it seems reasonable to introduce an additional variable which in some way depends on either hoarding or dishoarding to close the system. We can at this point profitably refer again to Professor Hicks' " otiose equation " theory of the rate of interest. " The ordinary method of economic theory would be to regard each price as determined by the supply and demand equation for the corresponding commodity or factor; the rate of interest as determined by the demand and supply for loans." [4] At the same time, however, the rate of interest could have been determined by the supply of and demand for *money*, as in Keynes' theory. But, in a single-period analysis the timeless interpretation of Say's Law holds, and the equation giving the supply of and demand for money follows from the rest and is not an *independent* equation of the system. Consequently, " the equation for the demand and supply of money is otiose." [5] According

[1] J. M. Keynes, *The General Theory of Employment, Interest and Money* (London, 1936), p. 172, italics added. The use of the term " movement " is rather unfortunate and obscures the basic point: a mass " retaining " of cash would have been more appropriate.

[2] The banks can, of course, *influence* the amount of income held unspent in the form of cash or deposits by bringing about a variation in the rate of interest; cf. *infra*, p. 635.

[3] P. A. Samuelson, " The Theory of Pump-priming Reëxamined," *American Economic Review*, XXX, 1940, p. 502.

[4] J. R. Hicks, *loc. cit.*, Economic Journal, XLVI, 1936, p. 246: cf. also *idem*, " Wages and Interest: the Dynamic Problem," Economic Journal, XLV, 1935, p. 456.

[5] *Ibid.*, Economic Journal, XLVI, 1936, p. 246: cf. also *idem*, *Value and Capital*, pp. 59-60, 155-8 and 314.

to Professor Hicks, then, the rate of interest can be determined on *either* of two markets: on the supply of and demand for loans market (*i.e.*, the market for the supply of and demand for investible funds in our terminology), *or* on the market where the quantity of money supplied is equated to the demand for it.[1] A similar method can be applied to a sequence analysis, and if the sequence interpretation of Say's Law necessarily holds, this "otiose equation" theory of the rate of interest is valid. But if the sequence interpretation of Say's Law does not necessarily hold, the equation of the demand for and supply of money no longer follows from the rest of the equations of the system.[2]

In his later article [3] Professor Hicks had a glimpse of this solution, though not, curiously enough, of the problem. He introduces an "investment rate of interest" [4] determined by the interaction of what we have called the supply of and demand for investible funds. This rate is confronted with a liquidity preference function, based on the first equation of set (1), which gives what Professor Hicks terms "the money rate of interest." [5] In the timeless Hicksian analysis, of course, both rates are identical. This double nomenclature is perfectly valid when it is realised that only two *aspects* of the same thing are being analysed: there are *not two* rates which are only made equal by an equilibrium process—there is only one rate of interest, whether the system is or is not in equilibrium. But in the sequence analysis the money rate (or the investment rate, depending on whether we start with Keynes or the classics) provides us with the second variable for which we are seeking.[6]

The problem of overdeterminateness is essentially one that Wicksell faced and never really solved.[7] As far as I am aware, the only attempted solution is that of Professor Frisch.[8] It can be noticed in passing that Professor Frisch has adopted the term "productivity rate of interest" [9] in the almost identical place of Professor Hicks' "investment rate of interest." The latter term seems preferable, since, as we shall soon see, the rate must not be con-

[1] Sir Dennis Robertson arrives at an almost identical conclusion by means of a different approach: see his "Some Notes on Mr. Keynes' 'Theory of Employment,'" *Quarterly Journal of Economics*, LI, 1937, pp. 181–3.

[2] This vitally important fact can, perhaps, be shown in another way. Professor Hicks' elimination of one equation depends on the fact that the value of the output (*i.e.*, of the received income) of any period equals the expenditure of that same period—the timeless interpretation of Say's Law holds. But if the expenditure takes place in the *following* period, as in the sequence analysis presented here, no longer need its value be *identical* to the value of the initial output—the sequence interpretation of Say's Law need not necessarily hold—and an additional *independent* equation makes its appearance and introduces another variable into the system.

[3] J. R. Hicks, *loc. cit.*, *Econometrica*, V, 1937, pp. 147–59.

[4] See *ibid.*, p. 156. [5] See *ibid.*, p. 157.

[6] In his *A Contribution to the Theory of the Trade Cycle* (Oxford, 1950), Professor Hicks' application of a monetary analysis for a system in which the sequence interpretation of Say's Law holds (Chap. XI) to a real analysis in which it does not hold (Chap. XII) is completely inconsistent, since his more comprehensive model involving both the real and monetary aspects, if he had worked it out, is overdeterminate.

[7] Cf. Professor Ohlin's "Introduction" to Wicksell's *Interest and Prices* (London, 1936), pp. xvii–xviii.

[8] R. Frisch, "On Wicksell," in *The Development of Economic Thought*, H. W. Speigel ed. (New York, 1952), pp. 652–99, and particularly pp. 683–93. Frisch, of course, does not present any special theory of the rate of interest: his only purpose is an analysis of Wicksell's theories.

[9] See *ibid.*, pp. 668 and 684.

fused with Wicksell's "natural rate of interest." The natural rate is virtually the profit rate when interest charges are excluded from costs and included in profits.

The new system can then be written:

$$\begin{array}{lll} i_t = L(Y_{(t-1)}, M_{(t-1)}) & K_t = k(A_{(t-1)}, r_t) & S_t = s(Y_{(t-1)}, i_t, r_t) \\ S_t = K_t & E_t = c(Y_{(t-1)}) & Y_t = E_t + K_t \end{array} \quad . \quad (8)$$

dropping the L subscript for convenience, where i_t is the money rate of interest in period t and r_t the investment rate in the same period. $A_{(t-1)}$ is a given parameter which will be explained in a moment. We then have six independent equations as before, but we now have six variables, Y_t, E_t, S_t, K_t, i_t and r_t, and three data, $M_{(t-1)}$, $A_{(t-1)}$ and $Y_{(t-1)}$. The system is no longer overdeterminate. It remains, now, to explain how this system of equations functions.

As we have seen, in the case when income is not rising there are three uses to which the received income of any period can be devoted in the next, viz., consumption expenditure, investment expenditure and the holding of money (*i.e.*, hoarding). Similarly, if income is rising there will be a net expansion of credit and/or a depletion of existing hoards (*i.e.*, dishoarding). Consequently, these three avenues can be regarded as competitive uses to which income can be devoted, and the "prices" of all three must play a part in determining the "demand" for each one (or "supply" of dishoarding if income is increasing). For the sake of brevity consumption expenditure can be assumed to be given, so that we are left with only two competitive demands (one of which may be a supply) for received income: the demand for investible funds and the demand for (supply of) hoards.

The money rate of interest must not be thought of as the gilt-edged rate of interest. It can be regarded as the average rate of interest charged on bank overdrafts in any period; or, better still, it can be regarded as the Bank Rate. It is similar to the Keynesian concept of the "own" rate of interest of money.[1] The investment rate of interest, on the other hand, is the rate which rules in the investment market proper, the market where the demand for investible funds is brought into equality with the supply of investible funds. It is, consequently, the rate of return which suppliers of investible funds receive on the funds which they have locked up in new investment. It is very probable, therefore, and will be assumed here, that the supply of investible funds is directly related to the investment rate of interest: an increase (decrease) in the investment rate of interest tends, *cet. par.*, to increase (decrease) the supply of investible funds. $s_r(\equiv \partial S_t/\partial r_t)$ is therefore positive.

Let us now consider the case when income is increasing so that net additional credit (assuming a continuous increase in income) is being drawn upon by the community to increase its expenditure in one period above its income in the previous period. It can be quite easily seen in this case that the supply of investible funds is inversely related to the money rate, since some of those who supply investible funds must run overdrafts to do so.

[1] See J. M. Keynes, *op. cit.*, pp. 222–3.

Such " savers " are, in fact, " borrowers." [1] But suppose that income is not rising. If the money rate of interest were zero anyone could become immediately liquid at no cost:[2] for anyone could incur a bank overdraft which would cost nothing. There would, therefore, be no incentive to hold as deposits or cash in any period some part of the received income of the previous period. Given the consumption expenditure of any period,[3] then, the whole of the difference between the received income of the previous period and this amount would be devoted to the supply of investible funds in the period. On the other hand, if the money rate of interest were not zero, in an otherwise similar set of circumstances, the incentives to liquidity clearly show that the supply of investible funds will be reduced, since some part of the received income must be held in a liquid form to satisfy liquidity preference. It follows, therefore, that, given the various incentives to liquidity, *cet. par.*, the higher the money rate, the less the supply of investible funds, and, of course, vice versa. Consequently, the supply of investible funds is inversely related to the money rate. $s_i(\equiv \partial S_t/\partial i_t)$ is negative.

Obviously since the supply of investible funds increases (decreases) with increasing (decreasing) income, $s_Y(\equiv \partial S_t/\partial Y_{(t-1)})$ is positive. Therefore

$$dS_t = s_Y dY_{(t-1)} + s_i di_t + s_r dr_t \quad . \quad . \quad . \quad . \quad . \quad (9)$$

gives the change in the supply of investible funds in period t due to changes in any of the three variables $Y_{(t-1)}$, i_t and r_t: s_Y and $s_r \equiv \partial S_t/\partial r_t$ are positive and s_i is negative.

In the case of increasing income it is obvious that, ignoring expectations, the investment rate must be higher than the money rate; otherwise some of those who supply investible funds, by running overdrafts, would incur a loss. But it does not follow that the supply of investible funds must be reduced to zero if the money rate is allowed to become greater than the investment rate. A larger amount of received income will probably be held in the form of money since the cost of becoming liquid has increased, but there is no reason at all for supposing that the supply of investible funds will fall to zero. In so far as a decrease in the supply of investible funds tends to raise the investment rate, and an increase in hoarding itself (*i.e.*, a reduction in the increase in income) tends, as will be shown in a moment, to reduce the money rate, the supply of investible funds need not fall as much as would otherwise be expected.[4]

The demand for investible funds is obviously inversely related, *cet. par.*, to the investment rate of interest: the higher (lower) the investment rate, the smaller (larger) the demand for investible funds. But the demand for

[1] I am indebted to Sir Dennis Robertson for pointing this out to me and thus forcing me to formulate the more general case.

[2] Of course, in practice, the banks would not lend freely to anyone without suitable collateral, but in such circumstances they would lend freely to the money market, and any charges made by the latter would not be in the nature of pure interest but rather in the nature of a risk premium or a service charge.

[3] So that, in fact, consumption expenditure itself depends on, *inter alia*, both rates of interest.

[4] Mr. Harrod does not share this point of view: cf. his *Towards a Dynamic Economics* (London, 1948), p. 70. Further, consumption expenditure may well be reduced.

investible funds is also a derived demand related in some way or other to expenditure on consumption goods, with or without a time-lag. It is not the purpose of this article to attempt to construct a comprehensive model which takes account of the accelerator, so that the other major factor affecting the demand for investible funds can be written in the completely non-committal form of an arbitrary parameter with a single-period time-lag, $A_{(t-1)}$. This parameter, of course, depends on, *inter alia*, expectations and the technical conditions of production. It can be so chosen, however, that the demand for investible funds is directly related to it. It follows, then, that

$$dK_t = k_A dA_{(t-1)} + k_r dr_t \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

where k_A ($\equiv \partial K_t/\partial A_{(t-1)}$) is positive and k_r ($\equiv \partial K_t/\partial r_t$) negative.

Since for any one period Say's Law in its timeless interpretation holds, $dK_t = dS_t$, and it follows that

$$s_Y dY_{(t-1)} + s_i di_t + s_r dr_t = k_A dA_{(t-1)} + k_r dr_t \quad . \quad . \quad . \quad (11)$$

So that

$$dr_t = \frac{k_A}{s_r - k_r} dA_{(t-1)} - \frac{s_Y}{s_r - k_r} dY_{(t-1)} - \frac{s_i}{s_r - k_r} di_t \quad . \quad (12)$$

Since k_r is negative and s_r is positive, the denominator must be positive. k_A is positive so that, *cet. par.*, the investment rate increases with the parameter A. s_Y is also positive so that, *cet. par.*, increasing income itself tends to reduce the investment rate: the s_Y coefficient gives a trend value to the supply of investible funds, so that a change in their supply does not *solely* depend on changes in the rates of interest. Finally, since s_i is negative, *cet. par.*, the money rate and the investment rate move in the same direction.

Substituting this value for dr_t, we find that

$$dK_t = \frac{k_A s_r}{s_r - k_r} dA_{(t-1)} - \frac{k_r s_Y}{s_r - k_r} dY_{(t-1)} - \frac{k_r s_i}{s_r - k_r} di_t \quad . \quad . \quad (13)$$

The demand for investible funds is thus directly related to the shift parameter, A, and to the increase in income, and inversely related to the money rate of interest.

Little need be said about the money rate of interest function, which, on total differentiation, becomes

$$di_t = L_Y dY_{(t-1)} + L_M dM_{(t-1)} \quad . \quad . \quad . \quad . \quad (14)$$

It is fairly obvious that, *cet. par.*, an increase (decrease) in income tends to raise (lower) the money rate of interest, since dishoarding (hoarding) will at the same time be taking place. In the second place, if an increase (decrease) in the quantity of money is to take place, *cet par.*, the money rate must be lowered (raised) in order to induce the community as a whole to spend the increased quantity of money (or to refrain from spending when a contraction in the quantity of money is required). Consequently, L_Y is positive and L_M is negative.[1]

[1] A comparison of equations (7) and (19) clearly shows that the multiplier is a *determinant* of the system and the velocity of money a *determinate*. It is therefore incorrect to apply a "multiplier," akin to velocity, to the quantity of money to arrive at a solution of the system, as has been attempted by V. Lutz, "Multiplier and Velocity Analysis: a Marriage," *Economica*, N.S. XXII, 1955, pp. 29–44. Prices must first be introduced into a multiplier analysis of the usual type (see

An interesting idea follows from this equation. If income is changing there must be some change in the quantity of money which will keep the money rate of interest constant, so that di_t is zero for every value of t. Such a limitation defines a type of neutral money system. So, assuming that L_Y and L_M are constant, for such a neutral money system

$$dM_{(t-1)} = -\frac{L_Y}{L_M} dY_{(t-1)} \quad . \quad . \quad . \quad . \quad . \quad (15)$$

Since L_M is negative, the change in the quantity of money and the change in income are directly related.

From the Fisherine quantity equation of money it follows that

$$v_{(t-1)}M_{(t-1)} = Y_{(t-1)} \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

where $v_{(t-1)}$ is the velocity of circulation in period $(t-1)$. Consequently,

$$v_{(t-1)}dM_{(t-1)} + M_{(t-1)}dv_{(t-1)} = dY_{(t-1)}. \quad . \quad . \quad . \quad (17)$$

Under a neutral money system it follows that

$$dv_{(t-1)} = \frac{dY_{(t-1)}}{Y_{(t-1)}} v_{(t-1)} \left(1 + v_{(t-1)} \frac{L_Y}{L_M}\right) \quad . \quad . \quad . \quad (18)$$

The change in the velocity, therefore, depends on the values of L_Y and L_M. If the velocity of circulation itself is now to remain constant it follows that

$$1 + v_{(t-1)} \frac{L_Y}{L_M} = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (19)$$

Assuming constant coefficients, this condition can always be fulfilled: for, since the velocity of circulation varies directly with the length of the period chosen, the period can always be so chosen that equation (19) holds. This suggests the definition of a period for a lagged sequence analysis.

Another point can be noticed about equations (12), (13) and (14). When income is falling hoarding is positive. This hoarding directly tends to lower the money rate. *It has no direct* [1] *effect on the investment rate :* only the supply of investible funds has a direct effect on this rate. In other words, hoarding must not be regarded as part of the supply of investible funds.[2] It is just here, of course, that the so-called virtues of " thrift " led the classical economists into confusion. Sir Dennis Robertson [3] seems to arrive at a result somewhat similar to the one reached here, but his method of attack is roundabout and very difficult to apply in a more elaborate model.

According to the loanable funds theory " the rate of interest is the price that equates the supply of ' credit,' or saving *plus* the net increase in the quantity of money in a period, to the demand for 'credit,' or investment *plus*

my forthcoming article in *Economica*, " The Interaction of the Multiplier and Price Mechanisms "), and this then incorporated into a sequence analysis for the real nature of such a " marriage " to be demonstrated.

[1] It has, of course, an indirect effect on the investment rate which depends on, *inter alia*, the state of liquidity preference as shown by equation (12).

[2] When I was formulating my ideas on this theory I used the term " saving " in place of the term " supply of investible funds." When I then expressly excluded hoarding from " saving " it led to a great deal of confusion. I am indebted to Sir Dennis Robertson and to Mr. M. Gaskin for bringing this point to my notice and suggesting a change in terminology.

[3] See D. H. Robertson, *Essays in Monetary Theory* (London, 1940), pp. 65–72.

net hoarding in a period." [1] It obviously makes no difference to this theory of course, if hoarding is subtracted from saving rather than added to investment. For the loanable funds theory to be true, then, the supply of investible funds (including net hoarding) must be unaffected by the money rate of interest. The money rate could thus be assumed constant, with L_M and L_Y zero: it is more reasonable to assume, however, that $s_i = 0$, so that the elasticity of supply of loanable funds with respect to the money rate of interest is zero. But if we assume that this elasticity is not zero, then our model leads to different results. In the loanable funds theory, an increase in hoarding must always tend to *increase* the hybrid rate of interest. Now an increase in hoarding must, firstly, tend to *reduce* the money rate and, by thus tending to *increase* the supply of investible funds, *reduce* the investment rate; secondly, however, an increase in hoarding itself implies a *decrease* in the supply of investible funds (taking consumption expenditure as given), and, therefore, sets up a tendency to *increase* the investment rate. In fact, assuming that $M_{(t-1)}$ and $A_{(t-1)}$ are constant, it follows directly from equations (12) and (14) that

$$dr_t = -\,dY_{(t-1)}\frac{1}{s_r - k_r}(s_Y + s_iL_Y) \equiv dH_{(t-1)}\frac{1}{s_r - k_r}(s_Y + s_iL_Y) \quad . \quad (20)$$

where $dH_{(t-1)}$ $(\equiv -\,dY_{(t-1)})$ is the total increase in hoarding in period $(t-1)$. Since s_i and k_r are negative and all the other coefficients positive, the investment rate will increase, remain constant or decrease according as $\left|s_Y\right| \gtreqless \left|s_iL_Y\right|$, which is a reasonable condition.

The savings-investment theory of the rate of interest can be easily shown to be merely a particular case of the sequence model. In this theory income is assumed to be fixed at an equilibrium level so that the dY's are zero. The quantity of money is also assumed constant so that $dM_{(t-1)} = 0$ and, therefore, $di_t = 0$, so that the money rate of interest is constant. Consequently, any change in the supply of investible funds is at the expense of an equal and opposite change in consumption expenditure—the Treasury View—so that the sequence interpretation of Say's Law is held to be valid. Investment, of course, is not affected by any accelerator (or it is assumed that no accelerator effect is present). Therefore, the (investment) rate of interest is determined by the equality of savings and investment.

It is not easy to link the general Keynesian system to our model, for, while income changes, both rates implicitly play a part; nevertheless, an attempt can be made. The supply of investible funds in the Keynesian system (*i.e.*, saving) is unaffected by the investment rate, so that $s_r = 0$—the elasticity of supply of investible funds with respect to the investment rate is zero. Suppose now that the supply of investible funds, being unaffected by the investment rate, gives the value of investment—this is a fair assumption,

[1] A. P. Lerner, "Alternative Formulations of the Theory of Interest," ECONOMIC JOURNAL, XLVIII, 1938, p. 213, italics in original. See also B. Ohlin, "Some Notes on the Stockholm Theory of Savings and Investment, II," ECONOMIC JOURNAL, XLVII, 1937, pp. 224–5.

since Keynes ignores accelerator effects. Since s_t is negative, investment is thus negatively related to the money rate, just as in the Keynesian model. At the same time, however, Keynes assumes that $L_Y = 0$—the elasticity of interest with respect to income is zero. Under these rigid conditions and assumptions, then, the Keynesian model would appear to be merely a limiting case of a more general system.

In conclusion, one final point must be raised. Can the money rate of interest be identified with the short-term rate of interest and the investment rate of interest with the long-term rate of interest? [1] No detailed examination of the problem can, of course, be undertaken here, and only one or two points will be advanced to support such an identification. In the first place the definitions of the two rates suggest an immediate identification. The money market is directly related to the supply of and the demand for money as such: in other words, it is the market where liquidity claims are brought into equilibrium with the available quantity of money, through, *inter alia*, movements in the short rate. So the short rate behaves in a way very similar to, and serves almost the same function as, the money rate.[2] The investment market proper is where the long-term rate is determined: it serves to help equate the demand for and the supply of "capital," and is, therefore, almost identical to the investment rate.

Secondly, can the relationship between the short and long rates be identified with the relationship between the money and investment rates? The effect of, say, a rise in the short rate is to force individuals to sell long-term securities; the market values of these securities fall and the long rate rises; and vice versa in the case of a fall in the short rate. It is, therefore, the change in the market values of existing securities which is the immediate *cause* of a change in the long rate,[3] and this new long rate in turn affects new investment. In a sense, then, it can be said that the static situation determines the dynamic. In contrast, in the theory presented in this article, the effect of a change in the money rate is transmitted to the investment rate via the interaction of liquidity preference and the supply of investible funds directed towards new investment. The change in the market values of existing securities (not shown in the system of equations) is thus the *effect* of the change in the investment rate and not the cause. So in the model presented here it is the dynamic situation that determines the static. Nevertheless, the related movements in the short and long rates are virtually identical to the related movements in the money and investment rates, even

[1] I am indebted to Sir Dennis Robertson for suggesting this to me.

[2] Cf. Kalecki's definition of the short rate. "The *short-term* rate of interest is the remuneration for foregoing the convenience of holding cash in its pure form": M. Kalecki, *Theory of Dynamic Economics* (London, 1954), p. 74, italics added.

[3] This would appear to be the general approach: see, *e.g.*, R. S. Sayers, *Modern Banking* (Oxford, 1947), pp. 141–9, and J. M. Keynes, *A Treatise on Money* (London, 1931), Vol. II, pp. 352–62. Cf., however, *ibid.*, p. 357, where Keynes assumes that the effect of the short rate on the long rate is direct and does not take place via changes in the market values of long-term securities. The assumption here, however, is not the same as the general relationship between the money and investment rates posited in this article, but is similar to the more restricted conditions postulated in the case when income is increasing.

although both mechanisms would appear to operate in a slightly different way.

Another consideration weighs very much in favour of the model presented here. In the classical and Keynesian systems there is only one rate of interest, presumably the long-term rate on gilt-edged.[1] The other (short-term) rate can always be brought in by an equation of the type

$$I_S = F(I_L) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (21)$$

where I_S is the short rate and I_L the long. Apart from showing that $F' > 0$ there has been no real attempt to show, in a *general* analysis, the exact shape of this function or its relation to the other variables (in particular to money and the supply of investible funds) of the economic system. In fact, for a system including this equation to remain consistent, F' cannot be regarded as an independent variable and must, therefore, be treated as a constant entirely independent of the other variables of the system. But if the system is analysed by means of a sequence model with the introduction of a lag into the income effect, a relationship such as equation (21) can be replaced by the theory worked out here, while at the same time a more exactly defined relationship, taking account of the general state of the economy, between the short (money) rate and the long (investment) rate can be discovered.

The ideas put forward in this article show that some sort of marriage between classical and Keynesian theories does provide a more reasonable set of hypotheses on which to build a sequence model with changing income to explain the rate of interest. The vital significance of the presence of investment (or dis-investment as the case may be) is surely changing income, and any attempt to construct a theory of the rate of interest by means of an equilibrium model in which income is constant is doomed to failure. There are fundamental truths in both types of equilibrium theory, but one method without the other is sterile. Liquidity preference and thrift both have parts to play—and important parts for a cyclical analysis. One of Robertson's many criticisms of Keynes' theory of the rate of interest was that it lumped together " in the same portmanteau those who desire to *hold* more money with those who desire to *use* it." [2] A similar criticism can be brought against the classical theory: it attempts to lump together in the same portmanteau those who desire to *use* more money with those who desire to *hold* it. *Both* holding *and* using must play their *distinct* parts, and their joint roles must not be lumped together into a loanable funds portmanteau packed so full of other classical what-nots that there is, in fact, no room for liquidity preference at all. At the same time the forces of productivity must be allowed to affect investment. This analysis presents only one form of dynamic model. There may well be many other forms; but the keynote of all such explanations must be *changing* income.

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[1] Cf. J. R. Hicks, *loc. cit.*, Economic Journal, XLVI, 1936, p. 248.
[2] D. H. Robertson, *loc. cit.*, *Quarterly Journal of Economics*, LI, 1937, pp. 176–7, italics in original.

SOME THEORETICAL IMPLICATIONS OF INTERNATIONAL ASPECTS OF THE UNITED STATES RECESSION 1953/54

THE reaction of the American and also the Sterling Area balance of payments to the recession in output and stagnation in demand in the United States in 1953/54 was remarkable in its contrast to earlier experience. Because of the attendant circumstances, especially the relative insignificance of income changes in the United States after an initial fall, coupled with vigorous expansion in Europe, it may well shed light on some aspects of the theory of international trade. In the following we shall endeavour to analyse in particular the behaviour of United States imports and inquire how far it supports the " elasticity-optimism " that has shaped American international economic policy planning, though it has encountered increasing scepticism in Britain.

I

A great deal of effort and ingenuity has been expended since the war on sustaining the view, reaching back to Marshall,[1] that the impact effect[2] of price movements on the volume of international trade, even of important countries, *i.e.*, countries whose policies have an effect on the price of the commodities which they export or import, is considerable enough to warrant optimism on the smoothness of readjustments effected through the free (or at least only globally, *i.e.*, monetarily, managed) play of the price mechanism.[3] These efforts were partly based on *a priori* reasoning, and partly on a skilful destruction of the significance of such statistical indications as were available, which all pointed to a relative non-responsiveness of foreign trade to price changes.

The immense inherent difficulties in the interpretation of foreign-trade statistics facilitated the defence of the accepted views. In this instance the vast number of simultaneously changing factors made any view but that derived from *a priori* reasoning difficult to sustain. In particular, it was

[1] Cf. Professor Haberler, " Some Comments on Professor Hansen's Note," *Review of Economics and Statistics*, 1944, p. 191, quoting Marshall (*Money, Credit and Commerce*, p. 171). It is interesting that Marshall seemed more optimistic for a " large and rich country " than smaller and non-industrial areas. He could, of course, not be expected to foresee a situation in which *one* large and rich country could in many respects be the equivalent of the rest of the world put together. His successors have no similar excuse.

[2] I have, in collaboration with Mr. Streeten, tried to show that the usual quasi-mathematical shorthand expression " elasticity of demand " tends to be misleading and inimical to clear thinking on matters of foreign economic policy. " The Inappropriateness of Simple Elasticity Concepts in the Analysis of Foreign Trade," *Institute of Statistics Bulletin*, Vol. 13, 1951, p. 65.

[3] There should be less disagreement on the reaction of smaller countries exporting standardised commodities with world markets, though even in their case the legitimate doubt might well be entertained about the desirability of the consequences of price adjustments, *e.g.*, devaluation, on the home distribution of income.

difficult, if not impossible, to isolate income and price movements sufficiently to arrive at definite empirical conclusions. The crisis of 1929–33, for instance, was followed by violent efforts of countries to isolate themselves through increasingly effective protection. It was complicated by many other unique features.[1] In 1949 devaluation by Western Europe, on the other hand, all but coincided with a vigorous American recovery, thus making any isolation of the effects of the former virtually impossible. Moreover, a public discussion preceded the British decision to devalue, in which American official circles joined. Thus a speculative withholding of American purchases was encouraged, which even if it did not obviously depress imports [2] must have contributed to the pressure on prices. The subsequent increase in the willingness to purchase after devaluation thus had little to do with the basic inter-relationship between gross national product and relative price levels on the one hand and imports, especially from the Sterling Area, on the other. All this distorted and detracted from the heuristic value of the statistical material.

II

The proportionate decline in the American gross national product after a year from the peak was precisely the same, *i.e.*, 3·8% in 1948 and 1949 as in 1953 and 1954. The impact on foreign countries, however, was drastically different. Instead of a dramatic loss of reserves up to September 1949 (and a slight net loss for the calendar year, even after strong recovery of foreign gold holdings in the fourth quarter is included), foreign countries added some $2·5 billion to their gold and dollar holdings.

Nothing shows more dramatically the change in the behaviour in the United States balance of payments than a comparison between actual development and the expectations elaborated by the National Planning Association [3] on the basis of past experience. This is shown in Table I. When column (6), the actual out-turn in the first half of 1954, is contrasted with column (4), the projection on the basis of a decline of 3–4%, which actually took place, it is seen that the decline in United States imports amounted to only $0·9 billion per annum instead of the expected $2·2 billion per annum, *i.e.*, only little more than two-fifths. Despite a cut in United States Government aid of over $1 billion, the out-turn was $1½ billion more favourable to the rest of the world than anticipated.

I do not wish to analyse at length the reasons for this rather startling difference. It has been done exhaustively by the Oxford Institute of Statistics.[4]

(*a*) The fact that U.S. military expenditures in Europe were low and falling in 1949, while they were large and rising up to 1954, must have played an important role: the proportion of the balance which is sensitive to

[1] *E.g.*, the reparations issue and the banking crisis.
[2] Cf. below on the volume of imports.
[3] *The American Economy in 1960* and *The U.S. Foreign Economic Policy*.
[4] *Bulletin*, August 1954.

TABLE I

Projection of the United States Balance of Payments

$ billion

	1948.	1949.	1953.	1954 projected assuming decline in United States G.N.P. of:		1954, 1st half, actual annual rates.
				3–4%.	10%.	
	(1)	(2)	(3)	(4)	(5)	(6)
Exports of goods and services	15·6	14·6	19·2	19·0	17·5	19·0
Less : Imports of goods and services	10·0	9·2	16·2	14·0	12·0	15·3
Plus : Net receipts of investment income	1·1	1·0	1·3	1·3	1·2	1·5
Equals : Balance on goods, services and investment income	6·7	6·4	4·3	6·3	6·7	5·2
Means of financing :						
United States Government sources (net)	5·0	6·0	6·2	6·2	6·2	5·0
United States private sources (net)	1·5	1·1	0·7 [a]	1·3	0·7	1·7
Liquidation of gold and dollar assets by foreign countries and international institutions (net) [b]	1·2	0·1	−2·5	−1·0	—	−1·5
Total means of financing	7·7	7·2	4·4	6·5	6·9	5·2
Errors and omissions	−1·0	−0·8	−0·1	−0·2	−0·2	—

[a] Small amount of net financing by private sources in 1953 results from large repayments of old investments by countries accumulating gold and dollar balances.

[b] Minus sign indicates foreign accumulation of gold and dollar assets.

Source: 1948–49, United States Department of Commerce.
1953 estimate and 1954 projections, National Planning Association.

"commercial changes" has decreased sharply. The increased availability of Western European supplies no doubt also exercised an important favourable influence because it enabled a displacement of some United States exports which had been essential previously. In the immediate post-war period the urgency for United States supplies was so great that the deterioration of the availability of dollars through a fall in American imports immediately plunged the rest of the world into a painful crisis, as purchases in the United States could not be restricted. Moreover, anticipatory speculative movements of "hot" capital in the past vastly exaggerated the loss of reserves and were the proximate cause of the crises of 1947, 1949 and 1951.

(*b*) There was also a remarkable difference in the pattern of American export-competition in world markets. This is shown in Table II. In 1949 United States prices fell by more than 10%. As British prices rose somewhat in the same period, a slightly greater gap opened. If the relation of British and American export prices in August 1948 is taken as 100, it fell to 89·5 a year later, on the eve of devaluation. The relation of British to American export prices in June 1954, after a whole year of American recession or stagnation, which left United States productive capacity some 10–12% under-employed, were slightly more favourable than they had been before

TABLE IIA

Relation of United Kingdom and United States Export Price Indices 1948–49

Relationship : August 1948 = 100

	United Kingdom.	United States.	Relationship.
1948:			
August	111	135	100
September	112	133	97·7
October	112	133	97·7
November	111	132	97·8
December	—	131	—
1949:			
January	113	132	96·1
February	112	130	95·5
March	112	128	94
April	112	128	94
May	113	126	91·7
June	113	126	91·7
July	113	123	89·5
August	113	123	89·5
September	113	123	89·5
October	113	120	87·3
November	114	120	86·6
December	115	121	86·5

TABLE IIB

Relation of United Kingdom and United States Export Price Indices 1953–54

Relationship : January 1953 = 100

	United Kingdom.	United States.	Relationship.
1953:			
January	101	205	100
February	101	204	99·5
March	101	205	100
April	100	203	100
May	100	203	100
June	99	201	100
July	100	202	99·5
August	100	203	100
September	100	204	100·5
October	100	204	100·5
November	99	204	101·5
December	99	203	101
1954:			
January	99	203	101
February	99	202	100·5
March	99	203	101
April	99	203	101
May	99	203	101
June	99	203	101

the start of the United States recession, despite the expansion of United Kingdom output and income by some 5%. This contrast is undoubtedly the outcome and a symptom of the favourable psychological atmosphere in managerial circles due to the existence of a Conservative Government and of the growing concentration of entrepreneurial decisions in the United States. These factors acting together prevented not merely the oft-predicted cumulative shrinkage in internal productive investment;[1] but also the cut-throat competition for markets which might have been equally anticipated on the basis of past experience.

It is notable that American exports were not only maintained after an initial dip but in the second quarter of 1954 increased appreciably and, in the view of the President's economic advisers, substantially contributed to the lessening of the deflationary pressure on American internal economic activity. This expansion of exports was to a large extent due to the vigorous recovery in Europe and the related overseas area, sustained despite the United States recession, which carried industrial output in the former up to 20% above the previous years' levels. Cheap (surplus) food exports no doubt contributed to this effect but cannot account for more than a portion of the difference.

This expansion is also due to the remarkable technical progress in the United States, which maintains demand abroad for American products, despite less favourable price relations because of the improvements [2] em-

TABLE III

Wages and Productivity in United States Manufacturing

	Prices.	Average gross wages.	Real wages.	Output per man.	Money efficiency wages.
	1947–49 = 100.	1939 = 100.			
1947	95·5	194	118	124	156·5
1948	102·8	213	118	127	167·7
1949	101·8	221	127	127	174·0
1950	102·8	231	127	137	168·6
1951	111·0	251	132	141	178·0
1952	113·5	264	136	141	187·2
1953	114·4	280	136	145	193·1

bodied. It should be noted that though money wages in the United States seem to have been increasing only slightly faster than output per man, real wages increased significantly less than efficiency. The increase in productivity seems to have contributed to the relative slowness of the rise

[1] Thus American fixed investment continued to add between 3½ and 4% per annum to American productive capacity, and modernised an even larger fraction, despite the stagnation of demand. The policy of agricultural price support was equally active in both periods.

[2] A stepping up of advertisement and improved credit terms, *i.e.*, the other paraphernalia of non-price competition in which America excels would have the same effect.

in money-efficiency wages which exerted some pressure on foreign countries where labour was in a better bargaining position.

The notable independence of European economic activity from the United States recession would not have been possible if the European balance of payments had not been buttressed by non-commercial receipts of dollars. Had an outflow of reserves started, " confidence " in the European Governments—so startlingly in contrast to previous occasions—would obviously have vanished speedily. As it was, however, confidence in the European Governments *was* maintained, rumours about an impending devaluation were *not* put about, and thus Europe was enabled to sustain her recovery. I shall return to this point presently.

III

Remarkable as this development is, the reaction of American demand for foreign products is of an even greater interest.

In the first place there can be little doubt that foreign countries could hardly have maintained their demand for United States exports had the slump in United States imports been of the expected magnitude: given the relative weakness of the reserve position of foreign countries, the reaction could not have been symmetrical: foreign countries would have been soon forced to restrict imports, and after the general abandonment, or weakening, of discriminating controls, this would only have been feasible by a general restriction of credit.

In the second place the development can be studied in a period of singularly important conjuncture: the United States attained in the first half of 1954 a position of stability at roughly 10–12% under-employment of existing productive equipment.[1] Thus speculative anticipations about a further considerable fall of imports due to United States causes were absent. Neither were there, on the other hand, rumours of devaluation elsewhere and thus speculative withholdings of American orders on account of factors acting from the outside. Confidence in the United States and British Governments provided the basis for stability. Thus the consequences of the initial United States income effect can be studied uncomplicated on either side by speculation.

Finally, the decline in the United States gross national product was, as we have already mentioned, not accompanied by a slump in Western Europe. On the contrary, output in European countries increased by anything between 5 and 20%, and this explained the increase in American exports. The consequences of this startlingly unexpected contrasting development was first the maintenance of the general level of prices outside America and then their gentle rise. The contrasting picture is analysed in Table IV.

While the unit value of United States imports fell all but 10% in 1949, there was an almost complete stability in 1953/54. As gross national product fell by the same proportion in the United States on both occasions, a far greater shrinkage of United States imports might have been expected in the

[1] Unemployment was significantly less.

TABLE IV

United States

Period.	Gross national product seasonally adjusted annual rates (1).	Industrial production (adjusted) (2).	Value of imports (3).	Volume of imports (4).	Unit value of imports (5).	Volume of imports in relation to industrial production (6) = (4)/(2).	Value of imports in relation to gross national product (7) = (3)/(1).
			Base : June 1948 = 100				
1948:							
3rd quarter	102	99	97	94	102	96	94
4th quarter	105	101	103	100	102	99	98
1949:							
1st quarter	103	98	97	96	101	98	94
2nd quarter	103	91	87	91	96	100	84
3rd quarter	102	88	82	87	94	99	81
4th quarter	102	90	96	103	93	115	94
1950:							
1st quarter	105	95	103	108	96	113	98
2nd quarter	111	102	105	107	98	105	95
			Base : January 1953 = 100				
1953:							
1st quarter	100	101	100	99	100	98	100
2nd quarter	103	101	102	102	100	101	100
3rd quarter	101	98	97	96	100	97	96
4th quarter	100	94	93	93	100	99	93
1954:							
1st quarter	98	90	92	91	100	101	94
2nd quarter	98	90	100	92	104	105	102

second instance on the hypothesis that the quantum of world trade reacts quickly and violently to relative price changes (especially as the income effect in Europe and elsewhere worked in the same direction).[1] Indeed, the projections shown in Table I did, quite reasonably, anticipate such a reaction, even though the National Planning Association, equally reasonably, did not even assume that the *fall* in the American national product would be accompanied by an *increase* in the European. This relative "inflation" in Europe ought to have brought retribution additional to that anticipated by the projection.

In fact, the deterioration was much less in the second than in the first period. Table IV contrasts the relationship between the evolution of the "money" and "real" sphere in United States production and imports. It is seen (Col. 6) that imports declined rather less than the volume of industrial production (after a slight relative fall in the third and fourth quarters of 1953). In this the experience is not very different to that of 1948/49. In

[1] The continuance of the rise in the volume of imports between the fourth quarter of 1949 and first quarter of 1950, despite an increase in prices, shows the importance of the recovery and of the cessation of speculative withholding of demand on the volume of United States imports in that period.

both cases imports were obviously primarily influenced by the volume of industrial production. The contrast on the monetary side, however, is marked: the value of imports (in distinction to their volume) did show a sharp (20%) fall relative to national product in 1949 before devaluation. In 1953/54 the decline was much less (7%) and only temporary. Though the national product did not recover, the value of imports did—despite a rise in price and despite the stagnation in income. Relative price movements did not seem to have had any effect on the volume of United States imports.[1] Devaluation (and even more the speculative anticipation of devaluation) seems to have worsened the total supply of dollars. If speculative movements can be avoided or squashed there is no justification for a change in exchange rates, at any rate on the basis of the demand reaction in the United States.[2]

Finally, Table V analyses the geographical impact. It is seen:

(*a*) that the seeming closing of the dollar gap in 1954 was due—

(i) to rising military expenditure (at the annual rate of $2·4 billion),

(ii) to unilateral transfers ($1·3 billion per annum),

(iii) to heavy United States private capital export,

(iv) to the maintenance of non-military imports;

(*b*) that the impact effect on the Sterling Area was also much less violent than in 1948, 23% in 1953/54 as against 38%. It was still sharper than the fall of total imports, which was 13 and 21% respectively between the extreme points.

As the fall in Sterling Area prices was particularly severe in 1948/49 the inference is obvious: "flexible" (dollar) prices do not promote favourable balance of payments for the weaker or dominated country.

[1] This does not mean that United States demand in the long run is not sensitive to violent increases in foreign prices by way of an increase of United States production (decrease of waste), though it is doubtful whether a considerable substitution of wool by synthetic fibres (amounting since the war to some 6–8 million bales or roughly equivalent to 16¼% of the Australian production) and of rubber by artificial rubber would not have taken place even if wool and rubber had been continuously available. The same is the case in the displacement of tin by plastics and other materials. Admittedly, even this asymmetric reaction need not be reversible. It might well be, for instance, that though the increase in foreign prices stimulated American production, a subsequent drop would not increase American demand for foreign products. American protection might be increased rather than imports. And on the basis of economic arguments alone such protection might well be justified. One can hardly help being impatient with pleas for freer trade in the United States which are based not on the argument of helping other countries (which is certainly morally desirable and may be a political necessity) but on the argument of increasing the United States standard of life. The average United States standard of life is far too high relatively to other countries in any case, and it is increasing, if anything, faster. Liberalisation, on the other hand, might hit certain sections of the United States population very hard. There is no domestic economic reason which would justify such repressive redistribution of income in the United States.

[2] Export competition in third markets might be a better justification. But if a United States depression is the cause of heightened export competition, it can be shown that a sufficiently large number of countries have an interest in discriminating against United States imports to make that policy preferable to devaluation (given the unfavourable reaction of United States import demand to devaluation).

TABLE V

Balance of Payments of the United States

ALL AREAS

$ million

	1948.			1949.		
	1st quarter.	2nd quarter.	Half-year.	1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:						
Total	4,413	4,231	8,644	4,266	4,414	8,680
Less unilateral military transfers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net total	4,413	4,231	8,644	4,266	4,414	8,680
Imports of goods and services:						
Military expenditures	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Other	2,523	2,534	5,057	2,608	2,422	5,030
Total	2,523	2,534	5,057	2,608	2,422	5,030
Balance	1,890	1,697	3,587	1,658	1,992	3,650
United States private capital (net outflow —)	−148	−266	−414	−159	−189	−348
Other unilateral private transfers (net outflow —)	−176	−159	−335	−147	−141	−288
Overall Balance	1,566	1,272	2,838	1,352	1,662	3,014
United States Government credits and grants	−1,366	−972	−2,338	−1,569	−1,602	−3,171
Balance on foreign capital and gold	− 555	−485	−1,040	100	− 236	− 136

	1953.			1954.		
	1st quarter.	2nd quarter.	Half-year.	1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:						
Total	5,425	5,750	11,175	4,767	5,699	10,466
Less unilateral military transfers	1,282	1,385	2,667	826	996	1,822
Net total	4,143	4,365	8,508	3,941	4,703	8,644
Imports of goods and services:						
Military expenditures	464	473	937	592	608	1,200
Other	3,573	3,840	7,413	3,125	3,521	6,646
Total	4,037	4,313	8,350	3,717	4,129	7,846
Balance	106	52	158	224	574	798
United States private capital (net outflow —)	−219	100	−119	−328	−316	−644
Other unilateral private transfers (net outflow —)	−120	−122	−242	−106	−110	−216
Overall Balance	−233	30	−203	−210	148	− 62
United States Government credits and grants	−496	−592	−1,088	−302	−381	−683
Balance on foreign capital and gold	758	398	1,156	499	260	759

Source: *Survey of Current Business.*

TABLE V—*continued*

Balance of Payments of the United States

UNITED KINGDOM

$ million

	1948 quarterly average.	1949.		
		1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:				
Total	260	281	329	610
Less unilateral military transfers	n.a.	n.a.	n.a.	n.a.
Net total	260	281	329	610
Imports of goods and services:				
Military expenditures	n.a.	n.a.	n.a.	n.a.
Other	205	242	199	441
Total	205	242	199	441
Balance	55	39	130	169
United States private capital (net outflow —)	— 5	—4	— 6	—10
Other unilateral private transfers (net outflow —)	—11	—9	—12	—21
Overall Balance	39	26	112	138
United States Government credits and grants (excluding military transfers)	—241	—276	—296	—572
Balance on foreign capital and gold	—131	— 41	—252	—293

	1953.			1954.		
	1st quarter.	2nd quarter.	Half-year.	1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:						
Total	271	260	531	244	284	528
Less unilateral military transfers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net total	271	260	531	244	284	528
Imports of goods and services:						
Military expenditures	33	35	68	67	77	144
Other	277	320	597	238	294	532
Total	310	355	665	305	371	676
Balance	—39	—95	—134	—61	— 87	—148
United States private capital (net outflow —)	3	32	35	38	— 23	15
Other unilateral private transfers (net outflow —)	— 9	— 9	— 18	— 8	— 11	— 19
Overall Balance	—45	—72	—117	—31	—121	—152
United States Government credits and grants (excluding military grants)	—95	—65	—160	—39	— 19	— 58
Balance on foreign capital and gold	325	192	517	126	262	388

Source: *Survey of Current Business.*

TABLE V—*continued*

Balance of payments of the United States

TOTAL STERLING AREA

$ million

	1948 quarterly average.	1949.		
		1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:				
Total	659	658	743	1401
Less unilateral military transfers	n.a.	n.a.	n.a.	n.a.
Net total	659	658	743	1401
Imports of goods and services:				
Military expenditures	n.a.	n.a.	n.a.	—
Other	493	534	441	975
Total	493	534	441	975
Balance	166	124	302	426
United States private capital (net outflow —)	— 22	—	— 13	— 13
Other unilateral private transfers (net outflow —)	— 19	— 19	— 20	— 39
Overall Balance	125	105	269	374
United States Government credits and grants	—241	—289	—327	—616
Balance on foreign capital and gold	—260	—104	—273	—377

	1953.			1954.		
	1st quarter.	2nd quarter.	Half-year.	1st quarter.	2nd quarter.	Half-year.
Exports of goods and services:						
Total	644	585	1,229	545	681	1,226
Less unilateral military transfers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net total	644	585	1,229	545	681	1,226
Imports of goods and services:						
Military expenditures	50	53	103	87	97	184
Other	636	683	1,319	515	620	1,135
Total	686	736	1,422	602	717	1,319
Balance	— 42	—151	—193	— 57	— 36	— 93
United States private capital (net outflow —)	— 22	17	— 5	34	— 25	9
Other unilateral private transfers (net outflow —)	— 24	— 20	— 44	— 19	— 23	— 42
Overall Balance	— 88	—154	—242	— 42	— 84	—126
United States Government credits and grants (excluding military transfers)	—120	— 96	—216	— 56	— 38	— 94
Balance on foreign capital and gold	353	209	562	107	268	375

Source: *Survey of Current Business.*

It could be argued, of course, that the relative stability of American imports in the face of price increases might be due to the relative insensitivity of the *raw-material* and *food-imports* to price changes and that, *tanto quanto*, a devaluation of the currencies of the countries which compete with American *manufactures* might still be helpful. The statistical material available is too scanty to enable the forming of a definite conclusion. Such as it is it certainly does not support this contention. The detailed yearly figures available up to 1952 indicate that the decline between 1948 and 1949 in the price of finished manufactures was slightly less than that of raw materials: $3\frac{1}{3}\%$ as against 4%. The decline in the volume of imports of the former was significantly smaller. In the second period for which the same detail is not available the value of imports of finished raw materials whose price again moved much in the same proportion as that of crude raw materials declined significantly less.

TABLE VI

Value of United States Imports for Consumption (by Economic Classes)

Monthly averages.	Crude materials.	Crude foodstuffs.	Manufactured foodstuffs and beverages.	Semi-manufactures.	Finished manufactures.
			Base : June 1948 = 100		
1948:					
Sept. quarter .	92·1	84·6	108·7	104·9	99·8
Dec. quarter .	88·2	114·6	103·8	108·6	111·3
1949:					
March quarter .	85·2	106·2	98·7	99·4	104·1
June quarter .	76·4	94·9	108·2	83·3	93·9
Sept. quarter .	72·0	89·7	105·8	76·6	89·8
Dec. quarter .	81·1	125·8	91·7	96·4	97·6
1950:					
March quarter .	91·1	131·8	100·8	103·5	96·6
June quarter .	87·1	108·1	116·2	120·1	109·0
			Base : January 1953 = 100		
1953:					
March quarter .	95·9	100·4	104·4	101·8	103·0
June quarter .	95·0	89·9	120·4	111·9	106·4
Sept. quarter .	91·3	89·7	115·4	97·9	102·1
Dec. quarter .	86·5	101·7	92·2	84·2	105·4
1954:					
March quarter .	86·6	112·6	104·3	77·2	92·1
June quarter .	88·7	106·5	132·6	88·5	107·8

Source: *Survey of Current Business.*

IV. CONCLUSION

I do not wish to generalise from this single and possibly singular experience. The dangers of doing so and of evolving general " laws " for foreign-trade " elasticities," and by extrapolation deriving policy recommendations, have been demonstrated only too abundantly in recent years. I have no

doubt that there is a critical point in the relation of the volume of United States to other Western national products below which United States imports may well decline even relatively to United States income, thus giving the impression (possibly quite falsely [1]) of a more considerable price effect, an effect which was so conspicuously absent in 1953–54.

What stands out clearly is that the common-sense view, which held that United States imports at under-employment levels are not sensitive to prices either upward or downward seems to have been borne out by the developments of the past two years. The explanation does not seem difficult. On the one hand, the import price has relatively little to do with the final retail prices charged for the finished goods imported and even less for the prices of the final products into which the raw materials imported enter. On the other hand, decreases in the price of competitive products would be matched by the under-employed economy or protective measures would be enacted. It was the confidence in the maintenance of stability of currencies which prevented speculation in 1954 and thus enabled the European countries to maintain this recovery and thus exploit the irresponsiveness of the United States foreign balance to foreign price-movements to the full. Rumours of devaluation or fluctuating exchanges might well have aggravated their own cause and increased the strain, both directly and through the inevitable anticipatory speculation. The United States Government by its military expenditure and aid policy happened to achieve the anti-cyclical effect which was (quite unjustifiably) hoped from the establishment of the various international institutions. The question remains, of course, whether in the absence of international tension a non-military increase in aid or other expenditure will be politically practicable in case of a future United States depression.

Whatever may be the answer to that—political—question the developments of the past years clearly put the (price) "elasticity-optimists," those who retain their faith in the sharp impact effect of price movements on the volume of international trade even at under-employment levels, who therefore favour devaluation, or even fluctuating exchange rates in those circumstances, under a pressing obligation to reassess the implications on their views of the statistical evidence on evolution of international trade in the past year.

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[1] Because the fall may well be due to the expansion in Europe. The exceptionally favourable development of the balance of payments of Europe in this unfavourable period certainly had a lasting consequence: the liberalisation of restrictions on dollar imports all but doubled United Kingdom dollar imports at $237 million between the first quarters of 1954 and 1955, while exports to the United States increased by only $25 million to $140 million. The development of the Western European trade balance with the United States was similar. Thus the policy of liberalisation permitted an expansion of United States exports without a sensible worsening of the terms of trade.

THE EFFECT OF DEPRECIATION ON THE OUTPUT–CAPITAL COEFFICIENT OF A FIRM[1]

1. Introduction

A PROPORTIONATE fall in output need not accompany the decline in value over time which characterises depreciable capital equipment. The decline in value of such assets may be the result of one or more of the following factors: (1) attrition of useful life, (2) rising repair costs, and (3) falling output. Factors (1) and (2), either singly or in combination, are sufficient to bring about a decline in the value of capital equipment over time, output per period of remaining life suffering no decline whatsoever. In fact, so long as asset life is not infinite (factor (1) is not zero), it is difficult to conceive of output falling as rapidly as value at each and every point in time. Ordinarily the output path is less steep than is the value path, and in certain conceivable cases output may not fall at all.

In general then, the disparity between capacity output and capital value can be expected to increase as capital equipment ages. For a firm as a whole it follows that the age distribution of its assets can exercise a profound effect (we shall term it the *depreciation effect*) on the relationship between capacity output and capital value. As the average age of capital equipment increases relative to useful life, the output–capital coefficient can be expected to increase also; on the other hand, as average age decreases, say by the rapid addition of new capital equipment to an old firm, the output–capital ratio can be expected to decrease.

A few of the consequences of the depreciation effect, which will be developed more fully and rigorously in subsequent pages, can be sketched. A firm entering an industry with new capital equipment will find it impossible to maintain *both* capacity output and capital value at their original levels. Therefore, if maximum productive efficiency is associated with a firm of a particular physical size, the maintenance of that size will involve financial manipulations. Further, as the *value* of new assets must be greater than that of older assets, entry into an industry with new assets may be blocked by restrictions in the capital market; in any case, such restrictions will be a factor favouring the acquisition of an old firm. On the other hand, if optimum size covers a range of outputs (or increases over time), the depreciation effect provides an ordinarily unnoticed opportunity for the new firm. Without increasing its capital value, *i.e.*, without investing additional funds, the new firm can increase its capacity output (and its share of the market if that grows at a slower pace) simply by reinvesting income-covered depreciation charges within the firm.

The analysis also has significance for aggregative problems. The output–

[1] The author has benefited from the criticisms of Professors Baumol and Gurley. Funds from the John Simon Guggenheim Memorial Foundation are gratefully acknowledged.

capital coefficient, useful in forecasting and in models of economic growth,[1] is itself not independent of the age distribution of capital equipment and therefore of changes in the rate of growth. On still another level of analysis, studies of the concentration of industry (in the sense of capacity output) can be criticised when based upon measures of asset value, if differences in rates of growth as between large and small firms are ignored.[2]

2. The Analysis

The depreciation effect is *not* the result of errors in computing depreciation charges. To make this absolutely clear, we shall develop the analysis upon the assumption that the straight-line technique yields equal periodic charges that accurately reflect reductions in an asset's present value, $\mathcal{N}$.[3] Assuming scrap value is zero and using G to indicate replacement cost, i for the interest rate and n for equipment life, the following definitions for a single asset are established:

$$\text{Depreciation} = G/n = \mathcal{N}_0 - \mathcal{N}_1 = \mathcal{N}_1 - \mathcal{N}_2 = \mathcal{N}_2 - \mathcal{N}_3 \ldots = \mathcal{N}_{n-1} - \text{O}.$$

$$\text{Profit rate} = i.$$

$$\text{Profit} = i\mathcal{N}_{t-1}.$$

$$\text{Net Receipts} = G/n + i\mathcal{N}_{t-1}.$$

The assumption also implies: (1) that asset prices are constant, and (2) that the efficiency of the asset (defined in terms of net receipts) declines with age (by iG/n per period).[4] If output and factor prices are constant, the decline in efficiency must result from a decline in output, a rise in repair costs or both.

Our first task is to show that capacity output and capital value do not generally move together as capital equipment ages. On the contrary we will maintain that replacement cost (equals original cost by assumption) is generally a much better index of capacity output, and that it is an exact index under some not unrealistic circumstances. Having established this, we can use the ratio of replacement cost to capital value as an approxima-

[1] The assumption that this coefficient is constant has been used as an aid in forecasting. (See *The Economic Report of the President* (January 1953), p. 91, and United States Department of Commerce, *Markets after the Defense Expansion* (Washington, 1952), p. 34. It has been an important assumption also in the discussions of the growth models initiated by Harrod and Domar. See, for example, R. F. Harrod, "An Essay in Dynamic Theory," Economic Journal, Vol. XLIX (March 1939), and Evsey Domar, "Expansion and Employment," *American Economic Review*, Vol. XXXVII, No. 1 (March 1947). So long as the rate of growth is also assumed to be constant over a long period of time, the depreciation effect is of no significance. As these models are made more realistic, however, the depreciation effect assumes importance.

[2] For example, Federal Trade Commission, *Report on the Concentration of Productive Facilities* (Washington, 1949), and M. A. Adelman, "The Measurement of Industrial Concentration," *Review of Economics and Statistics*, Vol. XXXIII (Nov. 1951), pp. 269–96. An alternative measure will be suggested below.

[3] If the technique yields only approximate results, the relationships developed will still hold for book values. The additional consequences that result will be touched upon toward the end of the paper.

[4] Compare with the "one-hoss-shay" type of asset so often assumed in economic analysis. The constant efficiency asset, characterised by both constant output and constant repair costs, requires a compound-interest depreciation method by which depreciation charges rise over time.

tion to the capacity-output–capital-value ratio upon whose movements our analysis depends.

Variations in Value and Output for the Single Asset

The value of a firm's output, P, at constant prices is simply the sum of variable costs (which are assumed to increase proportionately with output), kP; fixed costs (including depreciation and minimum maintenance costs), F; repair costs (related to age of capital equipment), M; and profit, H. Thus

$$P_t = kP_t + F + M_t + H_t = \frac{F + M_t + H_t}{1 - k}.$$

But $H_t - iN_{t-1}$, and as the present value of the asset, by definition, equals its original cost, G, minus its depreciation to date, $(t-1)G/n$, $H_t = iG - (t-1)iG/n$, and we have

$$P_t = \frac{F + M_t + iG[1 - (t-1)/n]}{1 - k}$$

The index of capacity output must be

$$\frac{P_t}{P_1} = \frac{F + M_t + iG[1 - (t-1)/n]}{F + iG} \tag{1}$$

Since we have assumed a constant replacement cost, G, of the asset, $G_{t-1} = G_0 = G$, and for the single asset the index of replacement cost is

$$\frac{G_{t-1}}{G_0} = 1 \tag{2}$$

Finally, since the capital value, N, equals G at $t = 0$, and declines by G/n each period, the index of capital value is

$$\frac{N_{t-1}}{N_0} = \frac{G - (t-1)G/n}{G} = 1 - (t-1)/n \tag{3}$$

We have the following relationship: [1]

$$[1 - (t-1)/n] \leqslant \frac{F + M_t + iG[1 - (t-1)/n]}{F + iG} \leqslant 1.$$

All three indexes are equal only when $t = 1$ or when $M_t = 0$ and $n \to \infty$. The first avoids the problem and the second holds only for non-depreciable assets. There are also some unrealistic values of i for which values of two indexes will be equal.[2]

[1] The inequality on the left can be verified by assuming the reverse, *i.e.*, that

$$1 - (t-1)/n > \frac{F + M_t + iG[1 - (t-1)/n]}{F + iG}.$$

Multiplying both sides by $F + iG$ yields $F + iG - F(t-1)/n - iG(t-1)/n > F + M_t + iG[1 - (t-1)/n]$, *i.e.*, $-F(t-1)/n > M_t$, which is clearly false.

[2] This can be seen as follows: Subtracting 1 from each index and dividing all by $[(t-1)/n]$, we have

$$-1 \leqslant \frac{\frac{M_t}{(t-1)iG/n} - 1}{\frac{F}{iG} + 1} \leqslant 0$$

The value index (corresponding to -1) is an exact index of output only if $i \to \infty$. On the other hand, replacement cost (corresponding to 0) is an exact index if $i = 0$.

Among the more realistic possibilities, we can distinguish two extreme cases. On the one hand, output may remain constant, the total requisite fall in profit (and net receipts) being solely the result of rising repair costs. In this case replacement cost is an exact index of capacity output ($M_t = (t-1)iG/n$).[1]

On the other hand, the requisite fall in profit may stem exclusively from falling output, repair costs remaining constant. As constant repair costs are included in F, M_t becomes zero. Subtracting 1 from each index and dividing all by $[(t=1)/n]$ we get

$$-1 < \frac{-1}{\frac{F}{iG}+1} < 0 \tag{4}$$

Value and replacement cost are equally good indexes of output in this case if $F = iG$, *i.e.*, if fixed costs per period are equal to profit in the first period (or the hypothetical profit that would be made in any period if assets were new); value is the better index if $F < iG$, replacement cost if $F > iG$. There appears to be little reason to prefer one index to the other.[2]

From the one extreme, then, where one index may be as good as the other, we find replacement cost steadily improving its advantage over capital value as an index of capacity output as the proportion of the fall in profit which is the result of increasing repair costs rises until the other extreme is reached where replacement cost is an exact index of capacity output. In the realistic area between the extremes there seems little reason to doubt the superiority of replacement cost as a capacity index.[3] We shall assume in succeeding

[1] Profit in the first period is iG, because $\mathcal{N}_0 = G$. For the profit rate, $iG/\mathcal{N}_0 = i$, to be constant period after period, the periodic fall in profit must equal interest on the fall in capital value, *i.e.*, interest on the depreciation charge or iG/n.

[2] Fixed costs under our construction include minimum maintenance costs and depreciation, as well as the usual interest and basic salaries paid regardless of the level of output. Whether these would amount to less than the interest rate applied to replacement cost is a moot question. Let us assume, however, that depreciation is the *only* fixed cost. F/iG becomes $(G/n)/iG$, *i.e.*, $1/in$. As $1/n$ is the depreciation rate, we can say that asset value as an index of capacity output is better than, equal to or poorer than replacement cost, depending upon whether the depreciation rate is less than, equal to or greater than the rate of interest. In industries where capital equipment has a long life the value index of output is likely to be better than it is in industries operating relatively short-lived equipment. Even in such cases, however, the existence of fixed costs other than depreciation makes it highly doubtful that value is better than replacement cost as an index of capacity output.

[3] If the straight-line method is inaccurate but used nevertheless, the two series of book figures which ensue can still be evaluated as capacity indexes. Assuming estimates of asset life are correct, straight-line depreciation can be inappropriate because the stream of net receipts stemming from the use of the asset diminishes with asset age too slowly or too rapidly. If net receipts diminish solely because of rising repair costs, gross fixed assets (the book figure for original cost) is an accurate index of capacity regardless of the rate of diminution and, for that matter, regardless of the depreciation technique used. If the diminution is the result solely of falling output, gross fixed assets is a better index the slower the rate of diminution. The depreciation technique consistent with the "one-hoss-shay" type of asset so often assumed by economists (neither falling output nor rising repair costs) is but another example in which output does not fall so that replacement cost is an exact index of capacity output. If assets are depreciated over a period shorter than asset life, as in accelerated depreciation, the net book figure is clearly an inferior index of output capacity.

sections that replacement cost is an *exact* index of output. In those cases where this assumption results in an exaggeration of the error involved in relying on capital value as an index of output the advantage remains that it provides a well-defined bench-mark from which modifications can be made with relative ease.

Reinvestment of Depreciation Allowances by the Firm

As we have seen, constancy of a firm's asset value does not imply constant output because of the depreciation effect. We shall now argue that with the

Changes in Replacement Cost and Equipment Value Associated with a Given Asset Value

(Equipment Life = Two Interinvestment Periods)

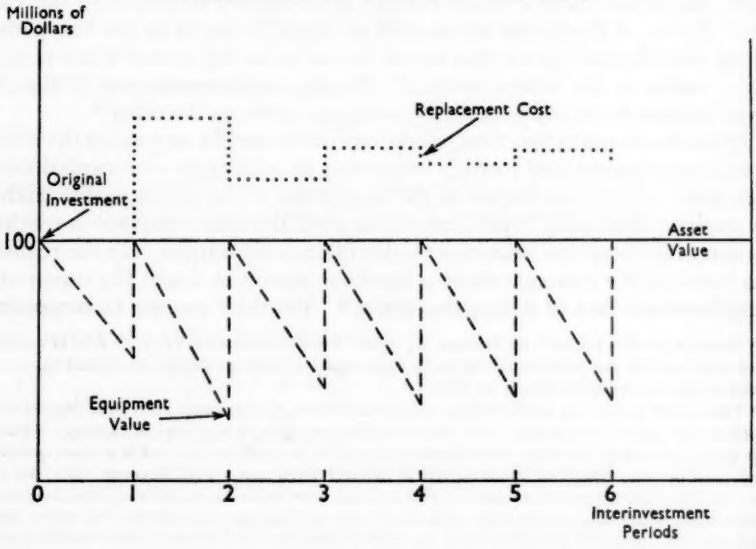

FIG. 1

passage of time a firm can increase its output capacity, its asset value remaining constant, simply by using income-covered depreciation charges to purchase more assets of the same kind.[1] We shall treat the period for which depreciation funds are held idle as a variable, p, the "inter-investment period"; continuous reinvestment becomes a special case.[2] The capacity-value coefficient for the firm, the ratio between G, now identified with

[1] If depreciation funds are invested temporarily in earning liquid assets, the income so earned is a profit, and under our assumptions must be paid out in the form of dividends. If, however, these earnings are invested in fixed assets, the amount is a new investment and can be treated in the same fashion as the original capital.

[2] Some assets are probably replaced or replenished at such short intervals that an assumption of continuous investment would not be unrealistic. Nevertheless, as assets become more substantial and longer-lived, it is likely that decisions to invest in them, whether for replacement or new

capacity output, and K, value of the firm's total assets (capital equipment plus idle depreciation funds), will tend toward an equilibrium value whose magnitude we seek to determine.

The movement toward this equilibrium is illustrated in Fig. 1. Replacement cost (G), equipment value (N) and asset value (K) are identical at the outset. As the equipment ages over each inter-investment period, its value declines. The amount of the decline, continuously covered by income, is held in the form of cash so that asset value remains constant. At the end of the first period these idle funds are invested in more capital equipment of the same kind; replacement cost and equipment value rise by the amount invested. As no funds are idle at the moment, equipment value is again identical with asset value, but replacement cost (and capacity) rises above its previous level because no equipment has yet been retired. Despite retirements in subsequent periods, replacement cost remains above the starting figure and above equipment value. We now proceed to determine the equilibrium relationship between replacement cost and asset value.

The Capacity–Value Coefficient in Equilibrium

The following additional symbols and terms will be useful:

$d = G/K$ = capacity–value ratio index.

$h = n/p$ = the life of fixed assets measured in inter-investment periods. Hence $1/h$ is that proportion of the life of an asset that expires each inter-investment period; *i.e.*, the straight-line depreciation rate per inter-investment period.

e will be used to designate equilibrium values.

The "equilibrium" capacity–value ratio will be achieved when the periodic depreciation charge (all of which is used for replacement) is equal to the original cost of the assets retired during the period, and when this amount remains unchanged throughout succeeding periods. This can be determined most easily by dealing with asset value at those moments when no depreciation funds are held idle; *i.e.*, just after each reinvestment of accumulated depreciation funds has been completed. At these moments asset value is identical with equipment value (see Fig. 1), and the ratio of replacement cost to equipment value can be substituted for the ratio of replacement cost to asset value.

In equilibrium capital equipment at the beginning of a period must be composed of h parts, ranging in age from the new piece of equipment to that to be abandoned at the end of the period. The replacement cost of each of these parts must be the same and equal to depreciation, $(1/h)G_e$, for the

investment purposes, are made less often and require more consideration. Thus, like dividends which are paid at regular intervals, depreciation funds may first be accumulated in the form of cash and invested only at regular intervals. These decisions may, in fact, be directly related to the dividend decisions. The fact that decisions are made periodically, however, does not mean that the investment which results is not continuous. Investment through new construction, for example, might be continuous though decisions to invest are taken periodically. Investments in purchased assets, however, may be concentrated at points of time. Either possibility is incorporated into the analysis by making the inter-investment period an explicit variable.

equilibrium condition to hold, but the value of each part will clearly be smaller, the shorter its remaining life. The value of any part can be defined as its original (or replacement) cost, $(1/h)G_e$, less its accumulated depreciation, its expired life times its periodic depreciation charge, $(1/h^2)G_e$. Thus the value of an asset three periods old would be $[(1/h)G_e - (3/h^2)G_e]$.

The value of all equipment, $\mathcal{N}_e$, must equal the sum of the values of each part. Thus

$$\mathcal{N}_e = (1/h)G_e + [(1/h)G_e - (1/h^2)G_e] + [(1/h)G_e - (2/h^2)G_e] + [(1/h)G_e - (3/h^2)G_e] + \ldots [(1/h)G_e - (h-1)/h^2G_e].$$

When these terms are collected,

$$\mathcal{N}_e = G_e - (1/h^2)G_e[1 + 2 + 3 + \ldots (h-1)]$$

Applying the usual formula for the sum of the first $h - 1$ integers of an arithmetic series $(= h(h-1)/2)$ this simplifies to $\mathcal{N}_e = G_e \frac{h+1}{2h}$, which, upon substitution of n/p for h, becomes

$$\mathcal{N}_e = G_e\left[\frac{n+p}{2n}\right] \tag{5}$$

The capacity–value ratio index, d, has been defined as G/K, but $\mathcal{N}_e$, the equipment value, as used here is equal to K, the value of the firm's total assets, since by assumption all depreciation funds have been reinvested in equipment. Hence in equilibrium,

$$d_e = \left[\frac{2n}{n+p}\right].^{1} \tag{6}$$

It is clear from equation (6) that the longer the length of life of capital equipment (*i.e.*, the greater n) and the shorter the period during which depreciation funds are held idle (*i.e.*, the smaller p), the greater the capacity-value coefficient becomes, approaching 2 as a limit. Hence, to the extent that the output capacity of some equipment is correctly indicated by its replacement cost, the *equilibrium* capacity of assets of given value ranges between one and two times the capacity of new assets of equal value.[2]

To sum up, the depreciation effect on capacity derives from a reduction in the average service life of assets. The value of the assets is reduced without a proportionate drop in their annual capacity. The value of the service

[1] This proof assumes that equilibrium tends to be established as illustrated in Fig. 1. Baumol has shown that the system will indeed converge to equilibrium. A more complex derivation of the author's results has been developed by Harberger and Christ, who also show that the system converges.

[2] It has been usual in examining depreciation problems in economics to assume that $p = 0$, *i.e.*, that depreciation funds are invested continuously. (See, for example, Friedrich and Vera Lutz, *The Theory of Investment of the Firm* (Princeton: Princeton University Press, 1951), pp. 147-53 and 230–3; and R. F. Fowler, *The Depreciation of Capital Analytically Considered* (London: P. S. King & Sons, Ltd., 1934), especially pp. 27 and 86). It is now clear that should this be the case the magnitude of the equilibrium depreciation effect is 2 regardless of the length of life of the assets. In equilibrium the ratio of replacement cost to *average equipment value* is always 2, but the existence of idle depreciation funds reduces the ratio of replacement cost to asset value to some smaller figure.

life so surrendered is made available to the firm if income covers depreciation charges. If these sums are reinvested periodically in like assets, annual capacity is increased at the expense of service life while asset value remains unchanged. Other things remaining equal, the purchase of assets of longer life or the use of a shorter inter-investment period will result in a larger equilibrium depreciation effect. *The equilibrium level of capacity, once reached, can be maintained perpetually, though each asset has a limited life, so long as income is sufficient to cover depreciation charges.*[1]

The Rate of Growth in Asset Value and Deviations from the Equilibrium Ratio

If depreciation funds are not reinvested, as is typical of a declining firm, the proportion of a firm's assets which are older increases over time so that the depreciation effect becomes larger and larger. On the other hand, the output–value coefficient of a firm that constantly makes net investment expenditures tends to be less than the equilibrium value. Thus the rate of growth of the firm in terms of value is an important determinant of the actual capacity–value coefficient of a firm.

3. Applications

Entry Restrictions and Expansion Possibilities

The depreciation effect is the source of certain problems for the prospective new firm, even if the entrepreneur is fully cognisant of it. To begin business with new equipment capable of producing given output, the new firm must be prepared to invest up to twice as much capital as a firm that operates at that level of output with assets having an equilibrium age distribution. The new firm achieves the same profit rate on its capital as the older enterprise (straight-line depreciation is assumed accurate), its net receipts being proportionately larger as a result of smaller unit repair costs. On the other hand, its turnover (ratio of sales receipts to asset value) is proportionately smaller and its profit–sales ratio proportionately larger.

With knowledge of the depreciation effect these characteristic differences

[1] These results can be modified to take account of working capital. If capacity is fully utilised, working capital, C, may, as an approximation, be regarded as a fixed proportion (or multiple), w, of replacement cost. Then the sum of replacement cost and working capital is a valid approximate index of capacity output. If the firm's only source of funds for purchasing equipment *and* adding to working capital is income-covered depreciation charges, the capacity–value ratio for the firm becomes the ratio of $(G + C)$ to $(K + C)$. It can be shown that in equilibrium

$$\frac{G_e + C_e}{K_e + C_e} = \frac{2nG_e(1 + w)}{G_e(n + p + 2nw)} = \frac{2n}{n + p}\left[\frac{1 + w}{1 + w\left(\frac{2n}{n + p}\right)}\right].$$

As $2n/(n + p)$, the depreciation effect without working capital, varies between 1 and 2, the depreciation effect with working capital is generally less than when working capital is independently financed, but greater than 1. As w varies from 0 toward ∞, the depreciation effect varies from $2n/(n + p)$ toward 1. Thus, even when income-covered depreciation charges represent the *sole* source of funds for both working capital and capital equipment considerable output growth is available to the new firm, even though nothing is added to its asset value.

should apparently cause the entrepreneur no alarm. Given imperfections in the capital market and other related institutional factors, however, entry into an industry at the optimum size with new assets may be restricted by the high investment–output ratio. If the new firm must borrow a sizeable proportion of the necessary funds the interest cost may be higher than it would be if it were buying out a firm with assets of equilibrium age distribution. If the owners of a new firm have no significant outside source for money capital and their own money capital is limited, the purchase of an existing firm would again be preferred over the purchase of new assets. This can be a source of pressure favoring merger as a means of expansion.

Further, if optimum size is to be maintained over time the firm is faced with a new set of difficulties. If it can replace with new assets only, its inter-investment period must equal asset life; it must store up depreciation charges in order to make replacement as the original equipment is retired from use. Its ratio of output capacity to asset value (including the idle funds) becomes 1. Given fixed interest charges and declining profits over the life span of each set of assets, and it becomes undesirable to hold idle funds. Barred from internal growth, the firm must purchase securities or, if the interest earned is less than interest cost, arrange to repay debt as depreciation charges accrue. Alternatively, it may be desirable to repay some capital funds to the owners of the firm. The return of capital to the stockholders may be barred, however, by law or by mortgage provisions if any funds are borrowed; institutional factors are often more restrictive to the reduction of capital investment than they are to its increase. In any event the systematic reduction of capital would normally require advance planning and would have the further effect that new financing would have to be arranged every time replacement took place.

To avoid these problems the firm might start operations below desired size with the intention of obtaining that size through the reinvestment of depreciation funds. If the market value of the assets is derived from net receipts at optimum size, however, the firm might find itself making losses or at least a reduced rate of return on capital because of the higher unit costs associated with operations at less than optimum size. Only if optimum size should extend over a considerable range could this procedure be used successfully. The reinvestment of depreciation funds then becomes an effective way of increasing the capacity of the firm and its share of industry output. The growth of the firm in terms of output is made possible without a parallel growth in its value.

Expansion Plans and Excess Capacity

If the effect of the ageing of assets on capacity–value ratios is not fully appreciated, the behavior of business firms may become less rational and may react on industry structure and performance. Business-men rely on several indicators in assessing the relative success of their operations. Among these are turnover and the rate of return on sales. As a new firm grows older the first can be expected to improve, but the unknowing manager might be

unduly concerned by a continuous decline in the latter.[1] If expansion plans, for example, are based at all upon changes in the rate of return on sales, the decline may inhibit expansion, which would in turn accelerate the decline. Expansion, of course, would slow the fall in the rate of return on sales as the acquisition of new assets would tend to "freshen" the average age of the firm's total assets.

If the new firm determines its relative position in the industry by its share of asset value or is obliged by institutional factors or stockholder pressures to permit no reduction in invested capital, output capacity will expand faster than asset value. Excess capacity may be created in this fashion throughout the industry and may become an especially serious problem in a new industry where all firms start at approximately the same time. While maintaining asset value or a rate of expansion in terms of value, the greater rate of expansion in capacity may result in excess facilities, lower prices and lower profits, which would in turn force a revaluation of the assets themselves. The initial cut-throat competition experienced in so many new industries (the post-war experience of the frozen-food industry is a recent example) may stem in part from this effect.

Size, Profit and Turnover

We turn now from the effects of the depreciation effect on the behavior of the firm to consider other matters to which it is relevant. Many efforts have been made to discover the relationship between firm size and profit rate. Most of these proceed by measuring size in terms of capital investment. Our analysis would indicate that these results can easily be misunderstood because capital investment is not a good measure of the size of firms in terms of output capacity when the asset ages of the firms are not the same.

Most of these studies have noted differences in rates of turnover between large and small firms which tend to bear out the point.[2] The smaller rates of turnover ascribed to large firms may not be a function of size so much as a function of rate of growth. The rapidly growing firm will have a shorter average asset age which would lead us to expect a lower rate of turnover. The problem becomes one of determining whether the large firms have in fact grown faster in the period preceding the analysis than have the smaller firms. Many arguments could be marshalled in support of this thesis.[3]

[1] It is interesting to note that E. I. du Pont de Nemours & Co. relates sales to *gross* capital investment in determining its rate of turnover. See Financial Management Series #94, *How the Du Pont Organization Appraises Its Performance* (New York: American Management Association, 1950). Inconsistently, perhaps, the firm watches its rate of return on gross rather than net investment. See, however, footnote on p. 666.

[2] See for example W. L. Crum, *The Effect of Size on Corporate Earnings and Condition* (Cambridge: Harvard University Graduate School of Business Administration, 1934), pp. 17–19.

[3] Berle and Means have presented estimates which purport to show that large corporations, as a group, have grown much more rapidly than all other corporations. These estimates show that from 1921 to 1923 the average annual rates of growth were 6·1% and 3·1% respectively. See A. A. Berle and G. C. Means, *The Modern Corporation and Private Property* (New York: The Macmillan Co., 1932), pp. 33–43. These results are not conclusive for the *individual* rates of growth. See also the author's unpublished dissertation, *Studies on the Growth of the Individual Firm* on deposit at The Johns Hopkins University.

Another conclusion found in these studies is that the ratio of profit to sales is higher for large corporations than it is for small corporations. We have seen that rapid growth tends to raise this ratio. Therefore, unless growth rates of large and small firms are comparable over the relevant preceding period, the characteristic attributed to size should, perhaps, be attributed to rate of growth.

The Concentration of Industry

These remarks have relevance for efforts to estimate the concentration of industry (in the sense of capacity output as opposed to wealth) by using value measures. If the larger firms in an industry tend to grow at the more rapid rates, value measures of concentration are likely to overestimate the degree of concentration (of output) at any given time.[1] Changes in the rates of growth within size classes from one period to another must be considered in any attempt to measure changes in concentration over time. Differences in growth rates aside, we have seen that as an absolute index of changes in capacity over time any measure of value has serious limitations. Measures gross of depreciation (which represent replacement cost of the firm's assets) are probably better; the use of both gross and net measures should establish a range which would be more illuminating than either alone.

Growth of the Individual Firm

The problem of growth has received increasing attention in recent years at both micro- and macro-levels. The depreciation effect has significance for both. The growth of the individual firm must often be conceived in terms of output because it is in response to or in anticipation of changes in the demand for output that a firm undertakes growth; yet asset value is often used as an index of growth. One measure yields a pattern of growth much different from the other. The depreciation effect would lead us to expect a *uniform* rate of growth in output for a new firm to be accompanied *at first* by a much *slower* rate of growth in asset value (perhaps even a decline). Thereafter, asset value would grow at a rate which would tend to increase over time, but, except for spurts of replacement expenditures which become smaller relative to asset value, this rate would never exceed the output rate.

The Aggregated Output–Capital Coefficient

The sharp differences in capacity–value ratios which can be found among firms tend to be ironed out in aggregative analysis. The bias involved in relating output of the economy to the value of assets or the change in one to

[1] The Federal Trade Commission, for example, has used net capital assets to measure concentration (*op. cit.*). Adelman has criticised this usage and has relied on total assets as being proportional to value added (*op. cit.*). The exclusion of allowances for depreciation represents a common error, if the intent is to measure capacity, unless growth rates of larger firms are similar to the growth rates of smaller firms. If the degree of integration is unchanged, output and value added are closely related (assuming repairs require more labour and not more material, they move together) so the relationship developed for output would also hold for value added. If vertical integration enters, replacement cost would tend to move with value added rather than with output.

the change in the other is probably not too great for short run analysis nor for constant rates of growth. The size of the ratio is dependent on the rate of growth, however, and is effected, therefore, by changes in the rate of growth.[1] The output–value ratio should be lower the more rapid a sustained rate of growth has been. By itself, therefore, a low ratio need not indicate that a rapid rate of growth is coming to an end because investment needs are being saturated.[2]

Some Repercussions of Book-value Relationships

When the straight-line method is used to compute depreciation under circumstances which do not warrant its use (as we have defined this), the relationships specified hold for the book figures, but the amount of net fixed assets (equipment value on the firm's books) no longer reflects market value. Figures for gross fixed assets (original cost on the books) are, of course, independent of most depreciation techniques used in estimating asset value. Though the book-value figures are erroneous, they are still basic data for many business decisions and for much economic analysis.

The nature of the errors introduced by the unwarranted application of the straight-line method depends upon which of a myriad of actual depreciation processes is being estimated by the straight-line technique. Our remarks will be limited to one admittedly extreme case which nevertheless may serve as a guide to the consequences of other possible variations. We shall assume that both output and repair costs are constant from one period to the next, so that depreciation, which results exclusively from attrition of asset life, should increase from period to period.[3] The use of the straight-line method (equal charges from period to period) under these circumstances results in reported profit figures which are understated for new assets (the depreciation charge is larger than it should be) and overstated for old assets. Reported profits for a particular asset are, in this case, independent of asset age and proportional to output and replacement cost.[4] Economic profit for each asset (net receipts less the depreciation charge which yields a uniform profit rate) falls as it ages, of course, but this is not reported. For the firm as a whole changes in reported profits are proportional to changes in capacity. Changes in the reported profit *rate* (the ratio of reported profit to reported asset value) depend on changes in the age distribution of assets, the newer the assets, the lower the reported profit rate. The reported profit

[1] It is interesting to note, however, that Domar, who has worked with these ratios in his growth models, has substituted gross assets (original cost) for asset value in his most recent work with output–capital ratios. Evsey Domar, "Depreciation, Replacement and Growth," Economic Journal (March 1953), p. 14.

[2] See references in note 1 on p. 655.

[3] This is, of course, the basis for arguments in support of the compound interest method of computing depreciation. See Perry Mason, *Principles of Public Utility Depreciation* (Chicago: American Accounting Association, 1937), pp. 60–70, and W. A. Paton, *Advanced Accounting* (New York: The Macmillan Co., 1941), p. 317.

[4] Net receipts are proportional to replacement cost, *i.e.*, output value and repair costs associated with each asset do not vary over time. As depreciation on each asset does not vary over time either, profit, the residual of these, is also constant for each asset over its life span.

rate rises as the capacity–book-value ratio increases in magnitude and falls when it decreases.[1]

It has been shown that the older the assets of a firm relative to their total useful life, the larger the capacity–book-value ratio. Under the conditions now assumed the same thing is true of the reported profit rate. A new firm would report a lower profit rate than an old firm; a growing firm would report a lower profit rate than a declining or stationary firm. Consequently the rate of growth of a firm may be an important determinant of its reported profit rate. Studies which relate size to profit rate on the basis of such data would be difficult to interpret. If the larger firms are actually growing the fastest, the lower profit rates which they report could be entirely the result of the depreciation effect on book values. Thus the use of profit rates to indicate relative efficiency requires the implicit assumption that growth rates are equal or that depreciation is accurately computed.

To the extent that business firms base their behaviour on reported profits, their decisions may be adversely affected. Business firms, for example, may base future expansion plans, in part, on the trends of past rates of profit. Other things being equal, the use of inaccurate straight-line depreciation may justify the expectation that rapid rates of growth will be accompanied by a falling reported rate of profit. If unaware of this possibility, those firms that have been contributing to a boom through heavy investment in new facilities may be discouraged from extending their present rates of expansion into the future.

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[1] Profits as a percentage of cost or of sales would remain constant so long as the degree of integration remains unchanged and capacity is utilised. Du Pont's practice of relating profit to gross investment (referred to in footnote 1 on page 663) may not be so irrational as it appears on the surface. Many of the equipment items in the chemical industry appear to have efficiency paths like that assumed here.

REVIEWS

West African Trade. By P. T. Bauer. (London: Cambridge University Press, 1954. Pp. xv + 450. 55*s.*)

This is a study, concentrating almost exclusively on the economies of Nigeria and the Gold Coast, of monopoly and competition and of market structure and organisation in an underdeveloped area. One of its principal themes is the importance of traders and middlemen in economic development. Mr. Bauer insists again and again on the productiveness of trade. He dwells on the role of the trader in economising resources, developing new markets, promoting specialisation and the growth of a money economy; on the need, as a prerequisite of successful development, for a class of trader-entrepreneurs, possessed of managerial and technical skills, given to accumulation, and sensitive to economic opportunities; and on the advantages of unrestricted competition between traders in the interests of producers and consumers alike. There cannot be too many intermediaries because those who perform no service will soon be by-passed. The multiplicity of traders at the retail and semi-retail stage involves no waste, since there is little or no capital to be under-utilised and little alternative productive use to which the time expended by the traders might be put. On the other hand, the concentration of import and export trade in few hands, and the restrictions by which this concentration is fortified, carry the familiar penalties of monopoly.

Mr. Bauer develops his theme with great skill and with a great wealth of detail. No more relentless and monumental analysis of the workings of monopoly and competition in the trade and marketing of any country has appeared for many years. Nor does Mr. Bauer's relentlessness stop at analysis. He examines official policy in the same spirit, pillorying almost every restriction on competition imposed or proposed by the governments concerned and every fallacy by which they have been defended. He recognises, particularly in Chapter 8, that there are forces at work making for concentration in trade with the colonies. The possession of large capital and integration with other trading activities, for example, yield advantages directly to the individual firm and may also be of service to the community. But in Mr. Bauer's view, these advantages present less formidable obstacles to the emergence of effective competitors than do mistaken official policies.

Among such policies he gives most prominence to those restricting entry, whether by way of immigration restrictions, quota limitations or licensing regulations. The first type of restriction falls with particular severity on Levantine traders, who, though few in number, exercise a valuable competitive check both on produce-buying syndicates and on the large import houses. What impresses him most in the other forms of restriction is their superfluousness: only too often they have been irrelevant, or even contrary, to the very purpose by which they were justified. One example is provided

by the system under which the purchase of agricultural produce for export remained subject to quota throughout the war (with a ban on new entrants that lasted until 1947) even although the British purchasing departments had undertaken to buy without limit of quantity. Another example is the system of compulsory produce inspection which enforces grading standards quite unrelated to price differentials on world markets.

The most controversial part of the book relates to the policies followed by the Marketing Boards. This occupies, however, only about one-fifth of the whole; and although the views expressed will already be familiar to most economists, they are more fully documented than in Mr. Bauer's earlier writings. He shows conclusively that there is little or no relation between the original objects of the Boards and the various apologies that have since been offered for their price policies. The simple fact of the matter is that the Boards were far too conservative and far too pessimistic and piled up surpluses that became increasingly embarrassing.

Mr. Bauer argues that producers were receiving, both during the war and in the early years of the Marketing Boards, about one-half, and often as little as one-third, of the commercial value of their produce. The difference between commercial value and producer price includes three elements, one of which represents export duty (and is not the *direct* responsibility of the Marketing Boards), the second represents the operating surplus retained by the Boards, and the third what Mr. Bauer calls " under-realisation " on sales. This third item corresponds to the difference between the price realised by the Boards and the price obtained by sellers in other countries; and many readers will be doubtful of the apparent implications that the Boards could have insisted on this higher price and that, if the Boards had not been created at all, " under-realisation " would not have arisen. This is one of the few points in the book where the evidence, although it may well be compelling, is not adequately marshalled.

Mr. Bauer sees the Marketing Boards " for good or evil . . . as instruments for the socialization of saving and for a large measure of government control and socialization of peasant production." It seems a little premature to assume that the Boards will continue to add to their surpluses indefinitely, but even if they do not, producers will probably forfeit in export levies some part of the value of their produce. How one views this possibility depends largely on the importance one attaches to a higher rate of saving as a means of accelerating development, and on the equity of differential taxation of one group of producers. Mr. Bauer rightly emphasises that private saving will suffer and that there are limits to the usefulness of public investment in promoting development in the private sector of the economy. But he might agree that the needs of the transport system, to which he draws special attention, warrant exceptional measures and that better transport might, for example, contribute at least as powerfully to the extension of the " traders' frontier " as still higher producer prices for groundnuts.

One cannot withhold astonishment at the mastery with which, single-handed, Mr. Bauer has surveyed so wide a field and demolished so many

misconceptions. As one puts down his book, one is driven to ask what programme of action he would put before governments under the inescapable urge to act. This is a question that he has elected not to answer. His book "is concerned solely with discussion, examination, and analysis of ideas and proposals put forward and of policies pursued . . . and with their results and implications" (p. 264). Perhaps Mr. Bauer protests too much; no one could write a book of this kind without conveying to the reader a bias in favour of particular lines of policy. One reader at least would cheerfully have sacrificed the two chapters on the economics of marketing reform and the demonstration which they contain of the folly of the proposals of others, in favour of a summary of Mr. Bauer's own views of the policies that West African governments might adopt.

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Value, Capital and Rent. By K. WICKSELL, translated by S. H. FROWEIN. (London: Allen & Unwin, 1954. Pp. 180. 18*s*.)

THE sixty years which have elapsed since Wicksell first published *Über Wert, Kapital und Rente* have witnessed a great increase in the complexities and technicalities of economic theory, and the publication of a vast number of text-books on the theory of value and capital. Yet when one reads this work to-day one still feels very inclined to recommend it at the top of the list to students of economic theory. It has an economy of means, lucidity and strength of logic which puts it far above the majority of text-books in the field. It is unmistakably the work of a distinguished mind, and the passage of time has done extraordinarily little to render it obsolete. Even the revolutionary developments in the theory of capital, money and economic fluctuations which took place in this country in the thirties, and have since become familiar to every student of economics, derived much from the two books published by Wicksell before the end of the nineteenth century—*Über Wert, Kapital und Rente* and *Geldzins und Güterpreise*. In his elegant and interesting foreword Professor Shackle indicates the thread running from the work of Wicksell to that of Lord Keynes and Professor Hayek, and he concludes that it is to Wicksell that we must give the title of the founder of the "*unified* theory of money, employment and the business cycle."

On the whole the English translation reads smoothly. In this connection it is perhaps in order, with a view to any future edition, to draw attention to one or two points. In Wicksell's preface the clause (p. 24 of the English version, 8 lines from the foot) "remuneration actually obtained from the different factors" should read "remuneration actually obtained by the different factors." One could suggest further refinements: for instance (p. 24) the clause "to estimate . . . the proportion of each element which is everywhere equal, from the known value of the total sum" might be more clearly rendered "to estimate the share of each element, which is the same

in all uses, in the known value of the total product." In the foreword to p. 25 "*stetiger verlauf*" might be translated "steady course" rather than "constant course." And is there any need to depart from the customary rendering of "*Kapitalzins*" by "interest" in favour of the clumsier "capital-interest"?

But these are minor blemishes; nor are they all necessarily entirely faults of translation. I would venture to suggest that the obscurity of p. 24 does not arise simply from the fact that Wicksell's summary of Wieser's view has been awkwardly translated; I think that Wicksell himself was confused as to the significance of Wieser's thesis. It is surely not true, as Wicksell asserts, that in principle the differential calculus can do anything which Wieser's system of simultaneous equation cannot do towards telling us "how and why the participation of different elements of production" is rewarded by such and such amounts. Wieser's approach is really that of modern activity analysis. He points out that if we know a sufficient number of varying optimal combinations in which all the scarce factors are used, we can deduce the price of each of these factors. In other words, using linear equations he assumes given technical coefficients of production in each production process, and asserts that for those processes used in equilibrium the sum of the products of each technical coefficient, multiplied by the respective equilibrium factor price, must equal the value of the product. The system of simultaneous linear equations thus obtained, when solved, yields the factor prices. To the present reviewer this way of spelling out the technical conditions of production does more to explain "how and why" the factors earn what they do earn, than does variation of factors "at the margin" against an unspecified technical background. At any rate, it is a valid alternative approach. However, Wicksell (alongside of Marshall and others) did his work well: every economist is to-day thoroughly grounded in marginal analysis, and the majority of readers will for this very reason almost certainly incline as Wicksell did towards marginal analysis. Altogether, the analysis presented in *Value, Capital and Rent* is admirably clear and incisive. We owe a big debt to Professor Shackle and Mr. Frowein for the publication of an English translation.

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L'Europe sans Rivages. By F. PERROUX. (Paris: Presses Universitaires de France, 1954. Pp. 668. 1,800 Frs.)

"SOME there are," Professor Perroux says in his Preface (p. v), "who think of Europe as a territory to be cultivated and defended; others see in it a work to be accomplished." His book is an eloquent plea for the latter view, a reasoned protest against the view of Europe as a geographical unit penned in the "little cape," the projection on the western end of the vast Asian Continent (p. 3). The work to be accomplished transcends national frontiers: it is on a world scale (p. 144–5). The great industrial centres,

such as the Ruhr, and the great commercial centres, such as London, are like magnetic poles from which lines of force radiate throughout the world.

Professor Perroux's treatment of the destiny of Europe is primarily economic, but underlying it is a moral conception, which he formulates in terms of liberty: the liberty of the individual to realise " values guaranteed by the experience of humanity, but transcending all experience " (p. 386). It is the privilege of Europe to combine " the technique which subdues the material world with the ideal of the open society " (*la société ouverte*) (p. 389). The " open society " is not to be identified with economic liberalism. " In its inspiration, it denies the category of enemy; it accepts the frontier which helps to unite, and refuses the frontier which separates; its aims extend to the limits of the human race " (p. 390).

Europe has not acted up to its ideals. Its mastery of the material world has threatened to transform Man himself into a mechanical slave, a process limited only by the sense of fraternity inspired from Christianity (pp. 391–2). The economy of welfare has been in conflict with the economy of power.

But even the economy of welfare itself has been perverted by the " avarice of nations " (p. 399). Every nation claims to reserve its material resources exclusively to its own people. In the present century, however, the economy of avarice has been yielding ground to an economy of " the whole man and all men " (p. 401): an economy which reckons " the costs of the human race " (*les couts de l'homme*). The process began in plans of development, conceived in terms of preparation for war. But the very same measures can be directed to the welfare of the whole species. " This emergence of the costs of the human race is an event which is likely to assume an importance in history comparable to the abolition of slavery " (p. 405).

Of Part III, forming the concluding 200 pages of Professor Perroux's work, " *L'Europe et la Dévalorisation des Frontières*," the greater portion is devoted to criticism of various plans for closer union of Western Europe: a customs union; a monetary union; the Coal and Steel Community; projects of an agricultural pool; Federation. There is much penetrating criticism of detail. But broadly the fault Professor Perroux finds with all of them is that they lead up to a community which would be not less exclusive than the nations which compose it—perhaps no more than a customs union discriminating against outside nations; perhaps a newly constituted Great Power inspired by the old nationalism. They are not steps towards the world he aspires to, in which the European spirit would be realised.

In that world a great part of the wealth absorbed in armaments would be diverted to an economy of welfare for the whole human species. To this end he urges an initiative from the United Nations to Soviet Russia for internally controlled disarmament (p. 409), an initiative " *dont il n'est pas permis, malgré les déceptions accumulées de préjuger l'échec.*" The end of the cold war is not yet, but perhaps it is beginning to seem not quite so remote.

He contrasts two possible localised experiments in integration (p. 440): that of the *nation aggrandie*, and that of the *dévalorisation des frontières*. The former would be surrounded by a tariff barrier; would have its own army,

money, transport system; would intervene as a third Great Power in the conflicts between the other two. The latter would reduce tariff barriers against outside nations as well as within its own boundaries; would use a world currency, and an inter-continental transport system; and would participate in a world army. Its political decisions would be devoted to maintaining peace and to defending, in peace and war, the values of civilisation.

Professor Perroux is looking forward to a world government. The national State, he says, exercises a monopoly of legitimate coercion (pp. 371 and 442). Does it not follow that, when frontiers are devalorised, that monopoly throughout the world will be exercised by the authority which wields the world's organised force? The constitution of this authority, its relation on one side to the developed countries, which believe in democracy, on another to the undeveloped, which would be its " colonies," and, at the same time, to those which fall into neither class, will raise problems which Professor Perroux does not face, and which he would perhaps say the time has hardly arrived to solve.

The problem of the standard of living in undeveloped countries cannot be dissociated from that of over-population. The fact of over-population, at any rate in Asia, Professor Perroux does indeed recognise (p. 208); of its bearing on any projects of improvement he has nothing to say.

Professor Perroux stops short of such questions. But his work of more than 600 pages is an important contribution to controversies which are preoccupying the world at the present time.

R. G. HAWTREY

London.

Economic Activity Analysis. Edited by OSKAR MORGENSTERN. (New York: John Wiley (London: Chapman & Hall), 1954. Pp. xviii + 554. 54*s.*)

THIS handsome lithographed volume contains papers produced by an Office of Naval Research project at Princeton University. It is, as usual, difficult to know whether to congratulate the United States Navy on its far-sighted support of academic work, or to sympathise with the United States tax-payer on the curious forms taken by his defence effort. For the finished product appears to deserve the attention of four groups of people, many of whom will not be reached because they will not think of looking in an expensive treatise, bulging with mathematics. Although it is possible to discern the connecting thread of the book, its contents would have had more influence scattered through the appropriate journals.

Let us take first, for it is in a class by itself, the paper by Karl Menger on the Laws of Return. This is a translation of two papers published in *Zeitschrift für Nationalökonomie* in 1936. It is a beautiful example of the application of mathematics to economic theory, which should have the attention of students everywhere. Menger's aim is to show precisely what meanings can be attached to diminishing and increasing returns, and what

properties of the production function are reflected in those various meanings. This is important, not only for the light which it throws on an important section of theory, but also for the revelation of the sloppiness of thinking in the most revered and classical formulations of the laws of returns. Another example of the poor quality of economists' logic is given in a later paper by Morgenstern; the belief that a system of equations can be solved if and only if the number of equations equals the number of unknowns. This condition is in general neither necessary nor sufficient.

The first four papers in the volume are about input–output analysis, and are reasonably accessible to the mathematically soft-headed. First a paper by Balderston sets out in a consistent notation general equilibrium systems from Walras to Leontief and von Neumann. Then Eckstein discusses in more detail the nature and use of the input–output system—a handy thirty pages to put into the hands of the inquirer, though perhaps a little too apt to imply that the difficulty of obtaining accurate results from an input–output system will be overcome in time. Then come two technical papers; one, by Balderston and Whitin, on the problem of aggregation—for the possible or realised transactions in a complex economy are inconceivably numerous, and a heroic degree of aggregation into industries is required to bring the system even within the compass of an electronic computer. Since this aggregation involves, or may involve, a departure from the assumptions on which valid predictions from the system must be based, it is important to know how far it can safely be carried. By experiments on models with different methods of aggregation, the authors show that the " errors " in the solutions are indeed far from negligible. A paper from Modlin and Rosenbluth discusses the proper treatment of foreign and domestic trade and transport charges in an input–output model.

The central section of the book is accessible only to mathematicians. It consists of two long papers by Wong, and two by Woodbury, mostly concerned with the habits of input–output matrices; some short but tough remarks by Bernstein on " continuous " programming; and an interesting diversion by Bott, Mayberry and Whitin into the theory of " trees ", which can be used to show whether an input–output system has a solution. The mathetical papers are distinguished by much elegance and clarity.

The book closes with a paper by Morgenstern, which is of interest to those who want to see the grand strategy of economic science. It has two main themes; first, that the possibilities of experiment in economics have been underestimated, and should be more fully exploited; second, that the invention of the electronic computer immensely widens the possibilities of our work, provided of course that innumerable dollars are available for its support. He contemplates, for instance, taking 100 time series, each of 600 terms, and computing 300 Fourier coefficients for each of them; or doing multiple correlations of fifty series, or serial correlations between hundreds of series. Professor Morgenstern writes of the widening horizon with such enthusiasm that it seems almost Luddite to inquire if the quality of the nut is likely to justify such formidable machinery for cracking it. The

calculating machine gives a vast extension to the powers of the reason; but to reason Marshall added the faculties of perception, imagination, sympathy and caution as needed in the equipment of the economist. One suspects that there are sharply diminishing returns to the development of one of the five faculties without the others.

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National Incomes and International Trade: a quantitative Analysis. By H. NEISSER and F. MODIGLIANI. (Urbana, Illinois: University of Illinois Press, 1953. Pp. 396. $7.50.)

THE authors of this important study present and analyse a system of equations connecting the volume of international trade with the incomes of the participating countries. For this purpose the world was divided into six parts: each of four major industrial countries (the United Kingdom, the United States, Germany and France), a group of seven minor industrial countries and a group consisting of the remaining or " primaries " countries. Commodities were classified into raw materials, foodstuffs and manufactures. The equations are of two types: import functions, determining the demand for imports in relation to national income and occasionally other variables, and export functions, which relate the exports of each member to the imports of its customers and again a few other variables. There are consequently thirty-six equations with thirty-six unknowns (the various import and export volumes), and the latter can be found once the incomes and the other independent variables are given.

The coefficients in these equations are estimated by least-squares methods from observations referring to the inter-war period, more particularly the years 1925–37. In several cases data were not available for part or whole of this period, or the period was divided into two parts. For each equation several variants were considered, and the fit finally obtained was usually good.

The equations thus obtained made it possible to investigate a number of problems in which the international interdependence of incomes is of the essence. Thus one chapter is devoted to the response of the volume of trade to income changes under varying assumptions, and another to the international transmission of income changes. Other applications deal with trade volumes under full employment and with the relative decline of international trade during the thirties.

It would be impossible to do justice to the wealth of results that emerges from these analyses, but the above summary should suffice to show that Professors Neisser and Modigliani set themselves an ambitious task and pursued it with commensurate skill and determination. They have made an outstanding contribution to the econometrics of international trade, and indeed to the study of international economics in general. It is all the more necessary to make some critical remarks about their procedures.

In the first place it appears that they consider national incomes the principal determinants of international trade even in the relatively short run. Unlike many other students of the subject, they seem to regard prices as of secondary importance. This comparative disregard of prices was fashionable in the nineteen-forties, when it even led to the naïve belief that, if only all countries pursued full-employment policies, the balance of payments would somehow look after itself. Traces of this belief are apparent in the Bretton Woods agreement. Events after the war have not confirmed these views. In fact, it has become clear that adjustments of domestic prices or exchange rates are indispensable for achieving and maintaining international equilibrium. Professors Neisser and Modigliani are not very explicit on the mechanism by which, in their model, international payments are balanced, but their estimates do not make it likely that income changes alone would be sufficient.

On the other hand, their model has the offsetting merit of manageability. It is in that respect very similar to Professor Leontief's input–output analysis. Perhaps this advantage outweighs even the extreme simplification of the export functions. The applications of their model to the problems mentioned earlier are among the most interesting features of the book. The "inverse" use of the model there displayed would have been much more difficult or impossible if the model had been more sophisticated. It is regrettable, however, that there is no indication of the effect of errors in the estimated coefficients on the results of these applications.

The lack of an explicit equilibrium model has also affected the statistical side of the authors' work. They recognise that in international economics the incomes of participating countries can hardly be regarded as exogenous, as is required by the least-squares estimation technique they use. In common with most contemporary econometricians they give various *ad hoc* arguments for using least squares all the same. Since previous attempts to apply simultaneous-equation techniques to international trade have been disappointing, the authors should not be blamed too much for their adherence to tradition. Even on a more practical level, however, their statistical methods do not always inspire confidence. Despite the shortness of the period of observation, they have sometimes split it up because of alleged structural changes. Some rather strange trend factors are introduced, and in at least one case (p. 308) they resorted to the indefensible expedient of leaving out an observation which did not fit.

The presentation of the results also leaves much to be desired. There is not a single diagram in the whole book, and since so many of the data series used underwent some manipulation by the authors after they were taken from published sources, they should have been made available to the reader. In the more theoretical chapters an undue desire to avoid mathematics has caused some ambiguities and obscurities.

Despite these occasional lapses, the book as a whole contains abundant proof of conscientious scholarship and clear exposition. Its methods and results will repay the most careful attention from practical and theoretical

students of international trade, who will find it one of the most valuable contributions of recent years.

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The Federal Reserve System, 1945–1949. By J. S. FFORDE. (London: Oxford University Press, 1954. Pp. vii + 351. 35*s*.)

DURING its forty years' existence the Federal Reserve System has seen its prestige fluctuate in a bewildering fashion. The short-lived confidence of the twenties that it could ensure economic stability gave way to the profound scepticism about monetary policy as a whole which characterised the period of the Great Depression and its aftermath. The lack of confidence in monetary weapons was intensified in the period immediately following the Second World War, when it was seen that the activities of the Federal Reserve were directed primarily to supporting the market in government securities. Mr. Fforde tells the story of the System's struggle to disengage itself from the sterile inflexibility to which the policy of bond support seemed at one time to have condemned it. It was the necessary prelude to the period since 1951 in which the Federal Reserve System has enhanced its reputation by its contributions to the control of American economic activity.

In his attempt to give a clear and logical presentation and interpretation of events in a credit system of great complexity, Mr. Fforde is by and large successful and has produced a book of great technical and theoretical interest for economists and bankers. The central problem, with which the System had to grapple at the end of the war, was to regain control over the lending activities of the commercial banks and at the same time prevent erratic fluctuations in the prices of government securities. Some support was necessary in the interests of monetary policy itself, for a large proportion of the new debt was in the hands of temporary holders. But the Treasury's insistence that support involved no departure from par in the prices of 2½% long-term government bonds involved the monetisation of debt, which enabled the commercial banks to offset pressure on their reserves caused by the retirement of debt. Mr. Fforde shows how in the immediate reconversion period this rigid interpretation of stability gave rise to the phenomena of " pattern playing " and " free riding." The commercial banks unloaded bills and certificates on to the System, and with the new reserves thus acquired bought up additional Treasury bonds in the market. Gradually the prices of bonds rose in order to give a yield to maturity which was consistent with confidence in the maintenance of the short-end of the rate curve. Both bank and non-bank holders found it profitable to realise their capital gains as the prices rose above par and to use the proceeds to buy longer bonds and gain a similar capital profit. Provided that existing short-term securities could always be unloaded on to the Reserve Banks, the logical conclusion was " a horizontal rate curve with the price of all bonds giving a yield to maturity of ⅞ per cent." Mr. Fforde makes the interesting point that the shift of deposits as between the thousands of independent banks was a

particularly aggravating factor. "Lacking precise liquidity rules regarding short-term assets, banks that lose deposits are prone to sell short-term securities, while those that gain them are prone to buy longer-term securities, leaving the central bank as the residual buyer in support of the short-term market."

This difficult situation was further aggravated by disagreements over policy between the Treasury and the System which arose out of differences in their primary and immediate responsibilities and in institutional background and traditions. The Federal Reserve officials gradually perceived that with a large government debt distributed widely among all classes of lenders, and with lenders coming to regard their marginal holdings of government securities as a principal source of funds for finance, there existed unprecedented power to influence the general availability of credit. But the essential prerequisite was the abandonment of the policy of inflexibly pegged interest-rates. This power could only be exercised provided that the System was free to increase or reduce the availability of credit either by being a willing purchaser or an aggressive seller of outstanding government securities with consequential changes in their prices. It was part of the System's case against the Treasury that such changes need only be fractional, because gradual institutional developments had by this time given the money markets a high sensitivity to relatively small changes in rates. As the Treasury's opposition gradually weakened, the necessary technique for operating a flexible monetary policy was developed, the essence of which was to ensure an orderly but not an inflexibly rigid market for government bonds.

Mr. Fforde's approach to his task of unfolding the story has much to commend it. His detailed account of the events of the period 1945–49 is preceded by an introductory survey of American monetary history since 1933 and a conclusion which analyses the final emergence of a positive central banking function. This last chapter, in which Mr. Fforde finally permits himself the liberty of giving a most lucid and stimulating theoretical analysis of Federal Reserve Policy throughout the period, is in the reviewer's opinion the best part of the book. His practice in the earlier parts of the book of confining himself to a factual description of very complex events is not entirely successful, particularly when he is describing the technicalities of operations in the American bond market. Any writer would find it difficult to make such an account completely intelligible, for it can be compared with the task of explaining verbally how to play bridge to someone who has never seen a pack of cards. But Mr. Fforde obviously has such a flair for exposition that one feels that he would have succeeded better had he related the mass of data to a theoretical framework. In other parts the level of exposition undoubtedly suffers because he has not given himself sufficient time to absorb his extensive material. But his book, apart from these minor blemishes, is a notable addition to banking and monetary literature, which no serious student of the subject can afford to ignore.

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Public Policies Toward Business. By CLAIR WILCOX. (Homewood, Illinois: Richard D. Irwin, 1955. Pp. ix + 898. $6.50.)

THE revolution in military tactics provoked by the machine-gun was countered relatively swiftly by the invention of the armoured fighting vehicle. The increase in the fire power of the author provided by the shorthand-writer, the dictaphone or facility on the typewriter can still be met by the reader only with the conventional, and dangerous, weapons of inattention or skimming. Hence, the growing acerbity of short-winded English reviewers towards the length of American texts. It is pleasant to be able to welcome Professor Wilcox's 900 pages more urbanely.

I hope that I am not misconstruing his purpose if I class this as a book intended to convey information rather than to provoke thought or present new ideas. As such, it meets an important need, and one which is still unsatisfied for the British undergraduate. We properly insist on the student's acquiring a working knowledge of the institutional framework within which business enterprises operate, including the framework created by government. But he has to be referred for such knowledge mainly to Command papers, annual reports of this agency or that and scattered articles in the more reputable financial and business periodicals. On few parts of the framework are there good and modern text-books.

Professor Wilcox is concerned with that area of policy in which government interferes directly with the freedom of action of individual business enterprises. By this I mean that such generalised influences as monetary, budgetary or external financial and commercial policy are excluded. Moreover, summary treatment of issues like industrial relations or capital-market regulation has been dictated by the organisation of the American undergraduate syllabus. It is natural that an American text should give pride of place to restrictions by government on the freedom of business enterprises to restrict their own (or others') freedom of action, and the first two hundred pages present a lucid and balanced account of the historical development and present state of anti-trust policy in the United States. From the normal we move steadily through the abnormal (I must emphasise that Professor Wilcox does not make the latter synonymous with the pathological): "supplementing competition" and "moderating" it—the distinction is a slippery one, replete with theoretical implications, although there is obviously a difference in kind in the purposes of, say, the Securities and Exchange Commission and the Commodity Credit Corporation; the substitution of regulation for competition; and, finally, public enterprise. For good measure, there is a chapter on other, mainly European, countries, which, though inevitably superficial and (not inevitably) over-sure in its judgments, contains, like the rest of the book, a surprising amount of accurate and concisely presented information. No doubt my confidence that I now understand the full meaning of agricultural parity is as misplaced as that of an American undergraduate who thinks that Professor Wilcox (who does not claim to) has taught him all about the Schuman plan; but both interested foreigner and

native student must be content with superficial knowledge on many issues and can remain grateful to the author.

More is needed to write an encyclopædia than wide knowledge, a good reference library or even—though this is important—a dedicated attitude towards teaching. The greatest need is for freedom from inhibitions and, in particular, freedom from doubts as to whether the facts presented justify any conclusions. It is perhaps a greater diffidence about the relevance of economic theory to practical economic affairs, in this field at least, which explains the absence of any modern English counterpart to Professor Wilcox's work. That explicit discussion of theory is excluded is no criticism of a book on institutions. But a great deal of theory is implied in the judgments, and to one raised on a different folklore it is a shock, provoking both impatience and envy, to see the cheerful confidence with which Professor Wilcox presents them. On pp. 11 and 12 we are given a *credo* in which competition and monopoly (both taken as having self-evident meanings) are identified with virtue and sin respectively. One hundred pages later we are provided with a definition of " workable competition," which is offered as a concept less precise than that of perfect competition but more useful for public policy. Seven hundred pages later we are told that workable competition may be defined either in terms of its results (to be judged by what standards?) or in terms of market structure. And we end with the comforting conclusions that, the American economy having performed so well, " the policies that have promoted—or permitted—these developments cannot have been far wrong." Certainly let us judge policies ultimately by their results. What one misses in Professor Wilcox's book is the recognition, though perhaps it is implied in the sentence quoted, that government policy towards business has had to be carried on in all countries without legitimate aid from economic analysis. Judges and officials and, less excusably, economists have indeed translated theorems from the world of logic to that of economic affairs. The fact remains that the number of propositions in the theory of competition which are both verifiable and useful is still minute, and that belief in " competition " (or knowledge of what it is to the American who equates it with virtue) is almost as much a matter of faith and naïve common sense as in the days of Adam Smith.

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Fair Competition. The law and economics of antitrust policy. By J. B. Dirlam and A. E. Kahn. (Ithaca, New York: Cornell University Press (London: Geoffrey Cumberlege), 1954. Pp. vii + 307. 36*s.*)

The Attack on Big Business. By J. D. Glover. (Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey Bros. & Swinfen), 1945. Pp. vii + 375. 48*s.*)

Mr. Dirlam and Mr. Kahn set out in their book to defend the present state of American anti-trust law against recent economic criticism. In the

post-war period anti-trust enforcement has been riding high: the courts have handed down far-reaching decisions often accompanied by *dicta* more radical than the decisions themselves. In the same period many economists have grown less confident about the economic rationale of anti-trust. Formerly it was often assumed that the anti-trust law, if rigorously enough enforced, would lead the economy towards a state of " pure competition " and that no amount of progress along this road could fail to be for good; latterly it has seemed palpable that oligopolistic industries in which competition is far from " pure " account for much that is fertile and progressive in the economy.

The combination of more strenuous enforcement with growing doubt about the economic end in view has led to much criticism of court decisions. Some economists have seen in decisions condemning measures of vertical integration, requirements contracts and the like, a threat to genuine efforts to secure economies of scale and organisation; the price discrimination statute has come under heavy fire on the ground that, as recently interpreted, it prevents suppliers from making economically justified price concessions to large integrated distributors. This criticism has been generalised in the proposition that the law should not bite on situations which, though rich in market imperfections, are yet " workably competitive." It has been urged that the " rule of reason " in anti-trust law—the judicial requirement that the Sherman Act prohibition of " every contract, combination . . . or conspiracy in restraint of trade " should be read as condemning only undue or unreasonable restraints—should involve a thorough economic analysis of each case in order to determine whether alleged restraints are " unreasonable " by reference to tests of economic performance.

In the first part of their book the authors consider the legal implications of this criticism, and in doing so give the clearest account that has yet appeared of the meaning of the anti-trust law and its relation to economic thinking about monopoly problems. They show that anti-trust is a rule of law designed to serve political and social ends and not merely (or mainly) the requirements of economic engineering. As a rule of law it must proscribe, not prescribe; the condition of having enforceable law is that the courts shall think in terms of forbidden business activities, and not, as Chief Justice Taft once put it, " set sail on a sea of doubt " by attempting a fresh economic assessment of the public interest in the context of each new case.

The " rule of reason " prescribes only that the courts shall satisfy themselves about the true character (which is what the lawyers call the " intent ") of the activities brought to their notice. When a distributor of moving pictures refuses to let a cinema have the " first run " of its films, it may have sound commercial reasons for its refusal, or it may be taking part in a boycott; when a large metal smelter obtains control, by contract or purchase, of important sources of ore or electric power, it may be seeking to compete more efficiently or it may be seeing to it that no competitor can invade its domain. The true explanation—the " intent "—has to be distinguished, as in any other field of law, by applying common sense to the evidence.

Economic consequences—facts about price levels and bankruptcies—may be important as evidence for the prosecution, for the monopolist, like anyone else who comes up against the law, is held to have intended the natural consequences of his acts. But subtle considerations of long-term economic advantage will not avail the defence, once the monopolistic intent is clear.

It is easy to see why the economist may be impatient with this argument; he wants to change situations which are economically unsound. He may rely on his belief, born of theoretical analysis, that certain market structures will result in lower output and higher prices, or he may wish to measure performance directly, by reference to rates of innovation, cost reduction and so forth. But, as the authors show, market structures may be imperfect, *e.g.*, oligopolistic, without there having been any business activity that could be justly penalised. Even fully-fledged monopoly power may, in Judge Hand's phrase, be " thrust upon " an enterprise solely by dint of superior business acumen or a legitimately protected patent position. As to performance, economists simply have not provided conclusive tests; there is no agreed means of predicting, for example, whether the motor-car industry in the United States or in Britain would be more or less efficient for being more or less concentrated than at present. The legal tests avoid these difficulties. The basic premise of anti-trust is that if deliberate grasping for monopoly power, whether by collusion or by exclusionary business tactics, is stopped, the economics of the matter will not go far wrong.

For those who seek lessons in American experience for anti-monopoly legislation elsewhere, it is salutary to have the American position so clearly set out and to note that it recognises a limit to the amount of economic inquiry which can be squared with the requirements of a rule of law. This, of course, is not the only possible position; other countries may succeed in devising administrative means of handling the problem with a higher degree of economic refinement. But to most Americans it is much more important that this type of business regulation should be enforced judicially, with a final appeal to the Supreme Court rather than to " the Minister," than that there shall be no possibility of economic error. Mr. Dirlam and Mr. Kahn believe that, in view of the political and social ends of effective anti-trust policy, the onus must lie on the economist and the business-man to show that the legal tests result in positive economic harm. In the second part of their book they analyse many recent leading cases in order to establish their contention that the recent criticism has not discharged the burden of proof. This part of the book is perhaps less satisfactory than the first part; to some extent the authors confirm their own thesis that satisfactory economic tests do not exist, though they succeed in showing that the complaints made about court decisions are often exaggerated or partial.

This book succeeds admirably in interpreting the central tradition of anti-trust in relation to current economic thought. It is worth noting that the recent Report of the Attorney-General's National Committee to Study the Anti-trust Laws reached a position very similar to that of Mr. Dirlam and Mr. Kahn, although the views which they criticise were clearly influential in

getting that Committee set up. This shows the strength of the tradition. Those who wish to understand and profit by American experience should have the Committee Report and this book ready to hand.

Professor Glover's book is lightweight by comparison. The author's aim was to provide " thoughtful business leaders " with a compilation of criticisms of " big business," but he has gone about the task in a unselective and heavy-handed way. Quotations from major works of economics or philosophy are lumped in with snippets from newspaper articles and political speeches, and the important arguments are rarely distinguished from the ephemeral and propagandist. Moreover, Professor Glover is the victim of his plan. Having provided chapter headings for " economic," " political and social " and " ethical and moral " criticism, he is committed to finding material for each head. This tends to make the book repetitive and much of the material in the " ethical and moral " chapters—with quotations from men like Brunner, Schweitzer, Gandhi, Mumford, Gill and many others whose concern is with the spiritual or æsthetic values of industrial civilisation in general—seems little relevant to " big business " as such. Space from this end of the book might have been devoted with advantage to a weightier treatment of the economic chapters.

Professor Glover draws attention, for example, to the type of argument which uses statistics of costs and profits to show that the largest companies are relatively inefficient, but explains that any figures which do not fit this thesis merely measure advantages of monopoly (or monopsony). It is a fair complaint that much careless (and some dishonest) work has been done on these lines. The difficulty is that in any particular case it might be true that a concern was both inefficient and " low-cost." What the " thoughtful business leaders " would no doubt like to know, like the rest of us, is what help economists can give in providing the tools for an honest examination of some genuinely difficult issues.

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The Reputation of the American Businessman. By S. DIAMOND. (Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. Pp. 209. 32*s.*)

MR. DIAMOND sets out to analyse obituary comment in the American Press at the death of six prominent business-men ranging in time from Stephen Girard to Henry Ford. The theme is simple: the Press attitudes to the business-man-hero move through a marked progression; the success of the early nineteenth-century business-man in the person of Girard is ascribed to strength of character; with Vanderbilt in 1877, however, personal character has been supplemented by recognition of a fortunate environment, and when we come to Morgan in 1913 the emphasis is very

largely on the latter. Alongside this shift is a growing tendency to treat the deceased, not as an outstanding and exceptional man, but as someone who typifies to an exaggerated degree the qualities of ordinary Americans as depicted in the folklore of capitalism (Morgan, for example, is described as suffering from the handicap of not being self-made!). This tendency reaches a peak in 1947 when Henry Ford is mourned as one who personified all the virtues, both public and private, of the American people, a product, not merely of "free enterprise," but of the entire American Way of Life. The author ascribes this shift to the growing undercurrent of criticism and hostility in the general public against an economic system which permits such careers and to the consequent need of the business community, and the Press which it largely controls, to protect the great man and free enterprise itself by identifying them with the social system as a whole. This thesis seems questionably simple. Although the power of advertising on newspaper comment has been amply demonstrated, the relationship between editor and public in this respect would appear to be more complex and dialectical than the author would have us believe. He also appears to overlook the facts that in the time of Girard or even Astor a Samuel Smiles career was plausible, whereas at the turn of this century impersonal factors were of infinitely greater moment, and that in a hundred years the general public itself may have become more sophisticated in its understanding of the forces of capitalism. But it makes an attractive theme, and would have provided a good idea for a well-written and perhaps ironic essay with conclusions diffidently suggested.

Unfortunately, the idea had to be put through the Ph.D. mill, and this has lessened the effectiveness of the book. The successive chapters devoted to the individual business-man-heroes are too largely composed of repetitive and prolix quotations from obituaries to advance the argument satisfactorily. Moreover, although the author fortunately eschews a "quantitative" treatment, he gives an impression of scientific detachment which one who has been employed in analysing the American Press would regard with scepticism: there is, for example, little attempt to indicate the size of circulation or influence of the different journals quoted. In developing his argument, which only becomes fully explicit in the Conclusion, Mr. Diamond has not been able to resist bringing in the fashionable ideas of the sociologists about "communication"; these, although valuable in themselves, are not organically related to an argument which could have been expressed in simple terms. But these are failings, not of the author, but of the "objective" system which produced the book in its present form.

F. THISTLETHWAITE

St. John's College,
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North American Supply. By H. D. HALL. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. (London: H.M. Stationery Office and Longmans, 1955. Pp. xi + 559. 35*s.*)

DURING the war the British Commonwealth received from the United States some $21 billion worth of munition supplies. Payment was made for $3½ billion worth; the balance was supplied on Lend-Lease. Over the whole of the war, America supplied just over one-fifth of the munitions delivered to British Forces. And this was about one-ninth of her own munitions production. The Canadian figures were naturally smaller. About $3¾ billion of munitions and war services was received, and this was over half of Canada's munition production. Mr. Duncan Hall's book is the history of how this happened. It deals mainly with supplies from the United States—a proportion dictated less by the relative importance of the supplies than by the fact that throughout the war the process of negotiation, procurement and assignment was far simpler with Canada.

On opening the book it is a surprise to find that over two-thirds of its length is devoted to the history of what happened before Pearl Harbour. On reflection one realises that, though less than 5% of the total munitions supplies we received came forward in this period, the allocation of space is right. It was in this period that the great problems of policy arose and that the British representatives in the States did so much to contribute towards the final successful outcome.

Mr. Hall describes how in those early days there were four objectives, of which two were gravely limited by the supply of dollars available. The first was to get immediate war supplies while Britain was in danger, and to keep us fed. The second was to create production facilities for munitions; in readiness both for that inevitable time when a way would be found to finance British needs over and above the available dollars and for the still later time when America itself would want a vast munitions production to equip her own Forces for war. The third was a constant process of tentative exploration with sympathetic Americans of the ways in which this further financing might be arranged, and the last objective was to convince the United States military and civil authorities of the magnitude of the production which would be needed to defeat Germany.

Over most of this period the leading personality on the British staffs in the United States was Arthur Purvis, a Canadian Scot of vivid personality and great imagination. It is he who is the hero of this book. At the time of his tragic death in August 1941 the supplies received were small; but Lend-Lease was in operation, though America was not yet at war, and a few weeks later the Victory Programme had been jointly worked out by the British and American Chiefs of Staff. Evidence of the success of the other objective did not come until much later when it was realised that in less than two years from Pearl Harbour the United States had reached its peak production: a process which in Britain had required over three years.

After Pearl Harbour there was a change in the scene. The early years had been dominated by individuals and by personal relationships. These were still important, but the main sources of decision shifted to the new machinery; the Combined Boards for Assignment, Raw Materials, Shipping and Production which operated with varying degrees of success from early 1942 onwards.

Attempts at this stage to secure top-level policy decisions to determine British military supplies were nearly always abortive. Munitions assignments were mostly decided on short-term detailed cases, and attempts at global planning of munitions production were in the end confined to marginal adjustments. Supplies of metals and tools were the subject of inevitable discussion on the export implications. But in the end we were given the aid asked for when it was really needed.

This complex story has been clearly and soberly told. Perhaps, as in other official histories, one might wish that a little more of the excitement of the times would show, but the many memoirs which have already covered these events (and which will no doubt continue to appear) can be relied upon to provide the missing drama.

One criticism may be made. The statistical material (apart from the excellent global figures already published by Professor Allen) seems inadequate to those of us who can still remember the vast but fascinating compilations which played so important a part in securing American supplies. What did the Purvis balance sheet look like? How did the Victory Programme compare with what was later required? How did the pattern of British requirements change with changing experience of the war?

The reader would appreciate the problems more with such background information. Two figures from the book are very revealing when they are contrasted. In December 1940, when our dollars were nearly all committed, Purvis, as a "shot in the dark," gave the President the then stupendous figure of $15 billion (four times the current annual production in the United States) as the amount of war supplies which the British Commonwealth still required from the United States in order to overcome Germany. The total received by VE Day was $21 billion.

HUGH WEEKS

London.

Industry and Science. By the MANCHESTER JOINT RESEARCH COUNCIL. (Manchester: Manchester University Press, 1954. Pp. viii + 188. 12*s.* 6*d.*)

THIS book sets out the results of an investigation into the relationship between science and industry in the greater Manchester area which was carried out in 1950–53 by the Manchester Joint Research Council, a body composed of representatives of the University and of the Manchester Chamber of Commerce. The investigation, which was conducted by means of interviews, covered 225 firms in a wide range of industries, excluding nationalised industries and certain other industries whose experience did not seem relevant to the purpose of the inquiry. Only firms employing fifty

or more persons were included, but very large firms with country-wide ramifications were omitted because it was felt that they had been adequately covered elsewhere. From those firms remaining the selection of those to be included in the survey was made on as random a basis as could be achieved. Three-quarters of the firms selected agreed to participate. By the end of the investigation, visits had been made to firms in the textile industry which covered 20% of the textile establishments in the area, and to firms in the engineering industries which covered 17% of the engineering establishments. Comparable figures for " modern " industries and miscellaneous industries were 22% and 23% respectively.

At the start of the investigation the view was accepted, for the purpose of the inquiry only, " that new scientific and technical knowledge is absorbed into certain sections of British industry too slowly, and that a scientific approach to the day-to-day problems of production and organisation is less common than it should be." The questions asked by the three investigators engaged on the survey—they were all men with knowledge of both science and industry—were designed to collect facts which would throw light on whether this view was correct or not. They inquired about the recruitment of scientists and technologists into industry and about the use made of them when they were there. They also inquired about the extent of research and development work carried out by firms and their contacts with research associations, universities and other sources of scientific information. Separate chapters of this book are devoted to each of these topics, and the results of the investigation are set out in detail in an Appendix which contains a large number of statistical tables.

It was found that qualified scientists or technologists were employed in 52% of the firms visited, these firms accounting for 84% of the labour force of the 225 firms. In all, there were 1,297 qualified men, rather more than half of whom were science graduates and the rest holders of diplomas. The great majority of these men were employed in seventy-seven firms judged by the investigators to be undertaking research and development from new knowledge. Nearly two-thirds of the firms which employed four or more graduates were found to be in the " modern " group of industries. About half the total number of science graduates were engaged in research and development work, and the other half in management, process control, technical sales and so on. Diploma-holders were less heavily engaged in research and development and more heavily in management, process control, etc. It is notable that nearly 14% of the graduates were on the boards of their companies, while the corresponding figure for diploma-holders was less than 6%.

When the investigators turned from inquiries about the number of scientists employed and the work they were doing to the relationship between this and the needs of the firms, they were, as they recognised, on much more shaky ground. Their conclusions are worth repeating, however: " If the cross-section is representative of the whole, one-third of industry does not really require much from science; another third requires mainly competent

application of established principles, and only the final third really needs the aid and stimulus which science alone can give. In the last and most important section the scientifically qualified staff is satisfactory in five-sixths of the firms; in the middle section it is adequate only in two-fifths."

Among the firms investigated, less than 20% were found to be undertaking their own research or had research facilities available in associated firms, but a considerable number undertook development work. Even where research was being carried out, little of it was of a fundamental nature. Research of this type is more commonly carried out in the large firms excluded from the survey and in research associations and universities. Of the firms visited, 151 were members of at least one research association, and 86% of these appeared to consult their associations actively; consultation was particularly marked in the textile and modern industries and among the larger firms. As high a proportion of firms as 40% made use of universities, more of them seeking advice on scientific matters than on recruitment. Those consulting universities included small firms with no qualified scientists on their staff, as well as firms employing a large number of graduates. As might have been expected, advice on scientific matters was sought most often from Manchester University and College of Technology, but contact was maintained with a large number of other universities, especially with Leeds on textile matters.

The investigators found that many firms made only limited use of such sources of scientific information as the Department of Scientific and Industrial Research, trade associations, suppliers and consultants. Most commonly, reliance is placed on suppliers of raw materials and plant. This source, more than any other, is responsible for scientific advice to over 40% of the firms visited. The investigators found no less than forty-four firms who gave them examples of unsolved scientific problems which, in the view of the investigators, could have been quickly solved if the firms had known whom to approach for help.

An important general conclusion drawn by the authors was that where scientists are employed they are not used wastefully, but that there is a significant proportion of firms which require scientific help but are not so staffed as to be in a position to make use of it. The authors' strongest impression of all was that deficiencies in the present situation are not so much due to a shortage of scientists as to the absence of attitudes favouring the use of science on the part of those at top management levels. A further impression was that much more liaison is needed between industry and those engaged in scientific research: " one of the clearest convictions this enquiry has left with those most intimately concerned is that more and better liaison and education are needed to a far greater degree than more and better science. The resources of science still untapped by industry are immense."

This is an interesting but by no means an exciting book. Several of the chapters contain a large number of statistics and are heavy reading. It would also have been a more satisfactory book if the authors had separated their value judgments about the importance of science to industry from their

account of the information they had collected. Given the nature of this investigation, however, it was probably too much to hope that the book resulting from it would be other than a somewhat pedestrian one. The book has undoubtedly suffered also from the fact that the Manchester Joint Research Council's principal investigator died before the account of the research could be fully written up. Even in its present form, however, the book contains much new information and a good deal of wise comment. It would be surprising if the investigation whose results are recorded here has not itself played a part in strengthening the links between industry and science in the Manchester area.

AUBREY SILBERSTON

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Government Finance and Fiscal Policy in Post-war Britain. By A. R. ILERSIC. (London: Staples Press, 1955. Pp. 274. 25*s*.)

MR. ILERSIC states in his preface that he has two types of reader in mind: the professional man with an interest in economics but no formal training, and the student. His book is more likely to be useful to the former class, since Mr. Ilersic is not very good at explaining his terms, and he presupposes a more considerable knowledge of the language and working of the City than the average student is likely to possess; on the other hand, there is little or no economic analysis of the type the student would normally require.

Mr. Ilersic treats his subject in three quite separate parts. The first is concerned with the national income, and the process of confronting the various relevant aggregates in making a rational plan for balancing the nation's accounts. While this section does not delve deep enough to show the real construction of the accounts, it is neatly done, and students in a hurry should find it clear and useful.

The second part deals with fiscal policy, but concentrates almost entirely on the effects of income and profits taxes, and of death duties, on incentives to work, save and invest. Mr. Ilersic tends to take the expediture side of the budget as a datum, and outlay taxes are hardly discussed. On the question of incentives Mr. Ilsersic is over-anxious to present the view of all parties and not to obtrude his own. The result is not satisfactory. Even the simplest logical argument must be supported by a quotation from someone; many of these are irrelevant to the time and place under discussion; most of them originate in a somewhat different context from the one Mr. Ilersic wants to use them for. This plays havoc with the logic of the argument. Mr. Ilersic is firmly persuaded of the perpetuity of the Age of Inflation; he is therefore much concerned with the burden of profits taxes on industry, especially through original cost depreciation allowances and F.I.F.O. stock valuations. Almost in the same breath, however, he allows himself to toy with the idea of the government supplanting corporate saving by budget surpluses, and distributing these to firms in accordance with its own preferences. Altogether this is the weakest part of the book.

When we reach Part III, on monetary policy and debt management, things greatly improve; this is evidently Mr. Ilersic's main interest. Although he still builds on the foundations laid by others, he now has a thesis to maintain, and on the whole it is a balanced and reasonable one. Several good points are made: such as the particular troubles for cheap money policy and "Dalton's" in particular, caused by the fact that railway trustee investors were by nature not to be satisfied by the particular fare laid before them by the Chancellor. Again, the portent of the slight but significant rise in interest rates in the early months of 1946 is well brought out. On the crucial matter of whether Mr. Dalton's cold feet in the second quarter of 1947 were justified or not, Mr. Ilersic appears not quite to have made up his mind; on the whole he seems inclined to the view that they were beyond artificial respiration. In general, Mr. Ilersic is inclined to run away too easily with psychological explanations, which have so often been an excuse for not seeking deeply enough for the real reasons underneath.

The reader should be warned against sundry petty carelessnesses: people get their wrong initials, Lord Piercy and Lord Eustace Percy seem to have got tied up; two dates are stated for the beginning of purchase tax, and so on.

URSULA K. HICKS

Oxford.

Stock Market Economics. By M. S. RIX. (London: Pitman, 1954. Pp. v + 284. 25*s.*)

THIS is an uneven book. It has some good descriptive chapters and analysis of matters within the stock exchange. It is not altogether successful in relating the affairs of the stock exchange to the economy as a whole. There is an excellent chapter on bonus issues which deserves to be read by those financial journalists who explain them away as mere book-keeping, as well as by those politicians who over-estimate their importance. Such matters as the gearing of ordinary shares and the advantages and disadvantages of shares of no par value are clearly and succinctly described. Two chapters on speculation are interesting though rather more controversial. The analysis here might have penetrated farther by exploring the answer to Keynes' question "Why are speculators buying shares?" Unnecessary jargon is avoided and the necessary technical terms are carefully explained. Miss Rix is not ashamed to explain points so elementary as to be taken for granted by those in the financial world but yet confusing to newcomers. For that many students will be grateful.

The weaknesses are more difficult to pinpoint. To indicate them it might be said that this book seems to describe a flat pond on which many bits of paper are floating, instead of a turbulent pool through which flow strong currents of industrial investment and government financing, subject to the undertow of inflation, ruffled by the eddies of nationalisation of industry, frothing at times from the effects of fiscal and monetary policies.

The chapter on saving and investment is weak. It is discouraging to be

told that " in any analysis of the stock markets the economist's notion of investment in real capital must be abandoned." Surely it is the difficult task of tracing the relationship between real investment and various types of stock-market activity that should bulk large in stock-exchange economics.

The impression is given that the official estimate of personal savings is gross in that dis-saving by individuals living beyond their means is treated as a possible deduction from it. Company savings are under-estimated; it seems to be suggested that they are declining. In discussing the investment policy of insurance companies no attempt is made to distinguish between the phase of correction of the abnormally high war-time proportion of funds in gilt-edged and normal growth. It is alleged to be a disadvantage of managed investment trusts that the market value of their shares do not bear a fixed relation to the net-asset value of the company. But if they did, investors making the market would be judging all investment-trust managements as of equal ability, and ignoring the effects of the different gearing of different trusts. This confusion arises from attempts to compare fixed-unit trusts, where there is neither gearing nor scope for the ability of management in changing the portfolio, with managed trusts, where there is both.

The analysis of the relationship between the gilt-edged and industrial markets is unsatisfactory. " Leadership " is ascribed to gilt-edged; but this is not fully explained. One reason given is that they are riskless; at this some holders of " Daltons " might demur; the distinction between safety of income and of capital needs to be made; inflation might also be mentioned at this point. It seems particularly doubtful in 1955 whether " Government stocks are at the head of all major movements " of prices, and also whether the effect of monetary policy on industrial share prices is only via the gilt-edged market.

The select bibliography, which includes such a general work as Samuelson's *Economics*, omits two of the standard works on the British capital market, Lavington and Grant.

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Cambridge.

An Introduction to Stochastic Processes with special reference to Methods and Applications. By M. S. BARTLETT. (London: Cambridge University Press, 1955. Pp. xiv + 312. 35*s*.)

THIS is not an easy book to review. It is a depository of a large amount of information about techniques of mathematical and statistical analysis, and its value can be properly appreciated only when a variety of practical problems have been investigated with its aid. Mere reading of the book, however painstaking and careful, cannot produce more than a rough assessment of its potential value. However, it is clear that Professor Bartlett has brought together in a compact and useful form an account of the recent advances in the theory and analysis of stochastic processes, which would

otherwise be found only in scattered books and journals. To this accomplishment, he has added an illuminating commentary on the relation between apparently dissimilar approaches to the same problem.

A stochastic process is one which has an element of chance in its structure, and the theory of such processes may be regarded, in Professor Bartlett's words, "as the 'dynamic' part of statistical theory, with a multiplicity of applications." Thus some knowledge of the theory of stochastic processes is necessary in order to deal adequately with problems concerned with population growth (especially when numbers are small), genetics, the servicing of machines liable to chance breakdowns, queues, the possible development of epidemics, bacterial mutations, cosmic-ray showers and the risks involved in running an insurance company or in gambling. Such problems can be discussed to some extent on deterministic, that is non-stochastic, lines, but Professor Bartlett properly lays great stress on the misleading conclusions that may be drawn from this common but inadequate approach. For example, the conditions which are favourable to the development of an epidemic of such a disease as measles can be properly understood only when the process is formulated in stochastic terms. In general, the factors leading to the stability of a particular process may be misunderstood if the stochastic element in the process is ignored.

Apparently diverse applications often have a common theoretical structure. In Professor Bartlett's book processes are classified according to their mathematical structure, and elegant general methods are developed for deducing the various probability distributions associated with the realisation of a particular class of process. Thus, in the case of a machine servicing problem, it is possible to deduce the limiting probability distribution of the machines' idle time given the number of operators available. Alternatively, when a process consists of a movement to and from a number of different "states," it is possible to calculate the probability distribution of the recurrence or passage times, *i.e.*, the time between repetition of a specified state or between the occurrence of two different specified states.

What message does this work convey to economists? Applied economists are already largely aware of the need to relate their statistical analyses to the manner in which their data are generated. Comparatively little, however, has been done by economic theorists in the way of taking account in their work of the stochastic nature of many economic processes. Until such an attempt is made, prediction even of a qualitative nature is likely to be misleading, and the applied economist or econometrician is not given a sufficient guide as to the appropriate means by which a theory can be refuted or verified or by which the values of parameters can be satisfactorily estimated. Recognition of the need for stochastic rather than deterministic economic theory is probably a considerably easier objective to attain than the actual formulation of such theories. However complex the mathematics deployed by Professor Bartlett to analyse stochastic processes, it is striking how simple are structures of the processes which have so far yielded their secrets to his powerful tools. It is difficult to conceive of any economic process which

could be idealised satisfactorily into an equivalently simple form. There is thus a great deal of hard exploratory work to be done before any noticeable progress is made. The first essential step is the creation of a body of theorists who will desire to know as much about probability theory as they at present do about the differential calculus.

A further obstacle to progress is the fact that the theory of stochastic processes is most highly developed for processes which are classed as stationary, that is, processes of which the realisations depend on time differences. However, it is evolutionary processes, of which the realisations depend on absolute time, that are likely to be commonly encountered in economic applications.

Professor Bartlett provides much information which is of great interest to the economic statistician, whether or not he is also concerned with the stochastic development or adaption of economic theory. Thus a whole chapter is devoted to the problems of statistical inference that arise in connection with stochastic processes. He discusses the circumstances under which the method of maximum likelihood is a valid method of estimation in such circumstances, and once again the peculiar difficulties which arise with evolutionary processes are made clear.

A final chapter is devoted to correlation and regression analysis of time series. The relation between correlogram analysis and harmonic analysis is clearly discussed, and the excessive sampling fluctuations that arise with the latter method are explained and remedies suggested.

Because of the conciseness of the presentation, the reading of this book involves considerable concentration. The effort is well worth making in order to obtain the benefit of Professor Bartlett's remarkable insight into the theory and applications of stochastic processes. Ample food for thought is provided for all those whose thoughts are rebellious or uneasy about deterministic economic theories.

A. D. Roy

Sidney Sussex College,
Cambridge.

Chance and Choice by Cardpack and Chessboard. Volume II. By L. Hogben. (London: Parrish, 1955. Pp. 917. 70*s*.)

The second volume of Professor Hogben's treatise on statistics mainly deals with regression and correlation, the analysis of variance and covariance, factor analysis, curve fitting and a variety of significance tests and estimation procedures. A number of text-books have appeared in the last decade which cover this field, but *Chance and Choice* offers something new to the research worker and the teacher in statistics.

As in the first volume, the sampling procedures and concepts are explained by exhaustive discussions of simple games with cards, dice and counters: these are illustrated by ingenious and elaborate pictures. Although only the exceptional pupil is likely to be able to plough through these explanations with understanding, lecturers in statistics should find here

some useful assistance in teaching their subject. Unfortunately, when the author is dealing with the branches of the subject which involve the normal distribution of errors, games with cards and dice prove to be less apposite, and he falls back on more orthodox examples about experiments on animals.

Those who do not know the subject matter already will find this a difficult book. This is partly because of the author's ingenious choice of new methods of proof and new notations, for example in the chapter on " The Algorithms of Summation," and partly because of his employment of elaborate words, and sentences such as this one: " Through Bowley the new evangel of correlation spread to the social sciences, expounded against a background of geometrical concepts which defy any attempt to make explicit the manifold circumstances in which co-variation may arise." At the beginning of Chapter 17, the discussion about fitting a regression coefficient is confused by choosing the example of Hooke's Law in the form $s = kt$, containing no additive constant. The most efficient estimate of k from observations (x_s, x_t) of s and t is then $\Sigma x_s x_t / \Sigma x_t^2$ (since we know that $s = 0$ when $t = 0$): the procedure recommended on pp. 726–7 is to compute the sample regression coefficient $K = \frac{\text{cov. } (x_s x_t)}{\text{var. } x_t}$, ignoring the information that $s = 0$ when $t = 0$, and a solution is provided which implies $s = kt + 0{\cdot}10$ instead of $s = kt$. The confusion could have been avoided by discussing Hooke's Law in its more usual form $l = kt + c$.

An excellent feature of this book is the careful examination of the assumptions underlying the accepted procedures of statistical analysis. Most teachers are likely to learn something new or be reminded of something they have forgotten if they read through the forty-page chapter on " Assumptions underlying analysis and synthesis of variance ": although this chapter is partly based on the work of Crump and Eisenhart, it contains many original suggestions and new twists in the exposition of this important subject.

The final chapter on " Second Thoughts on Significance " also provides the fruits of original and careful thought about the foundations of the subject. A particularly refreshing touch in this chapter is the author's modest claim in the final section 20.09 " The Show Must Go On," that he has been learning the subject while writing the book: he thus sets a good example to other writers of text-books on statistics.

D. G. CHAMPERNOWNE

Nuffield College,
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The Malthusian Population Theory. By G. F. McCLEARY. (London: Faber, 1953. Pp. 191. 15*s*.)

IN this book Mr. McCleary offers a short and most readable introduction to Malthusian Population Theory. He has tried to give in brief terms a biographical sketch of Malthus' life, an outline of the thesis of the first and second editions of the " Essay " and a discussion of the applicability of Mal-

thusian Theory to present world conditions. It should be said at the outset that this is a good introduction in that it puts the Malthusian viewpoint clearly and well. For a similar exposition of the contrary arguments the reader will have a look elsewhere.

Mr. McCleary begins with a chapter on Malthus' life prior to 1798, and the historical background to the first edition of the " Essay on Population." He then summarises the arguments of the first and second editions and comments on the changes in the later version. He is anxious to emphasise that Malthus has an importance far beyond the population theory he advanced. Whether that theory is right or wrong, he performed the great service of stirring up a debate which made everybody (the public, the politicians and the social scientists) acutely aware of the danger that population might outrun subsistance. In addition to this, his statistical studies in the second edition are a landmark in the use of inductive methods in the social sciences. Mr. McCleary gives an excellent short summary of this statistical work in which Malthus tried to analyse the factors controlling population in the various states of Europe. However, it is a most approving summary, and at the end the reader feels very much inclined to accept Malthus' claim that the " facts " have confirmed his principle of population. Mr. McCleary does not go out of his way to emphasise the criticisms by later writers of both the data and the methods used.

The next chapters follow Malthus through the steps of the second edition and deal with " projects for making the world better." These cover Malthus' attacks on contemporary proposals for utopian states, and projects for reducing poverty by emigration, poor relief, foundling hospitals, etc. Malthus attacks the mercantilist arguments that a large population will lead to a powerful and wealthy state and defines the government's duties as restraining population by educating the masses to " moral restraint " and encouraging production by creating conditions of security for the capitalists. Embedded in this is an interesting section on Malthus and the Corn Laws. In 1803 he seemed most luke-warm toward them compared with his pamphlet of 1815.

The chapter on " Malthus and Contraception " gives the views of Condorcet, Francis Place and Robert Owen, and details Malthus' rejection of this alternative. Mr. McCleary's emphasis on this rejection seems unnecessary. Despite the term " neo-Malthusianism " few people have ever doubted that what Malthus advocated was celibacy until marriage, the postponement of marriage until the children could well be supported and during marriage the avoidance of birth control of any kind. The major criticism, which Mr. McCleary does not discuss, is that these proposals are unrealistic. If married couples are to abandon all methods of regulating their families it becomes almost impossible to forecast the number of children any particular pair will acquire. Yet Malthus asks each prospective bride and groom to estimate both their family size and their future income (which will depend on the actions of all other couples) and delay their marriage accordingly. As a sole road to world prosperity this hardly seems reliable.

Most of the second half of Mr. McCleary's book is concerned with " Was Malthus right about population? " He deals first with some criticisms by J. S. Mill, Sidgwick and Cannan on the use of ratios in Malthusian Theory. Malthus' claim that an unchecked population tends to double every twenty-five years was, Mr. McCleary believes, proved by the factual evidence in his second edition. The limitation of food increase to an arithmetic series is more speculative, but seems eminently reasonable because of diminishing returns. Then comes the interesting Nassau Senior–Malthus correspondence of 1829, which is reproduced in full (five letters). The basic difference between them was the relative importance to be attached to what Malthus called " passion between the sexes " and what Adam Smith had called " the desire of bettering our condition." By emphasising the former Malthus had arrived at his conclusion that population tends to increase faster than subsistence. Senior accented the latter and reached precisely the opposite conclusion. Mr. McCleary admits that Senior has proved right in Western Europe but only due to two factors which Malthus could not be expected to foresee, cheap food from the new world and the widespread use of contraception. But, he claims, this is unusual. Malthus' view held good over all the world in his own time, and is still valid for most of the world to-day. But this concession to Senior is inadequate. It ignores the strongest point in his position, which is that history has always, in general, shown Malthus to be wrong. The masses in most countries of the world may be poverty stricken and even liable to death by famine or disease, yet in so far as their conditions are above those of the savage the long-run tendency must have been for subsistance to grow faster than population. If the world " tendency " is to be used meaningfully, in the sense of " most-likely to happen," then Malthus must be turned on his head. He cannot be saved by conceding the different experience of Western Europe in the last hundred years.

To say with Nassau Senior that the normal expectation is that subsistence will grow faster than population is not to assert that the reverse can never occur. Mr. McCleary gives us a harrowing chapter on the rate of population increase in Asia to-day; an increase, be it noticed, brought about by the success of medical science in lowering the death-rate—a circumstance which Malthus had not envisaged. But then, unlike his hero, Mr. McCleary offers birth control as a solution to the problem.

The book concludes with a charming biographical chapter on Malthus at Haileybury and a copy of the inscription on the commemorative tablet in Bath Abbey. Just another of those deft touches which make this book so readable.

K. Berrill

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Marx and Engels on Malthus. Edited by R. L. MEEK. (London: Lawrence & Wishart, 1953. Pp. 190. 15*s.*)

IN this slim volume Dr. Meek provides us with a forty-page introductory essay and selections from the writings of Marx and Engels on Malthus. The selections are grouped under three headings: Marx and Engels on the Malthusian Theory of Population; Marx on Malthus and Economic Theory in General; Marx and Engels on Malthus and Darwinism. The subjects are interesting, and some of the material is published in English for the first time; notably the whole of the section on Marx on Malthus and Economic Theory in General, which is taken from previously untranslated portions of *Theories of Surplus Value*.

The selections on population theory tell their story well. Marx and Engels knew that on this issue they must fight tooth and claw, for socialism itself was at stake. Malthus, in the first edition of his " Essay," had set out to prove that utopian societies were impossible and, if his theory of the continuous pressure of population on food supplies was sound, he had succeeded, for the iron law of wages would always be valid, no matter what social system prevailed. As Marx put it in the *Critique of the Gotha Programme*, " basing themselves directly on this, the economists have proved for fifty years and more that socialism cannot abolish poverty *which has its basis in nature*, but can only generalise it, distribute it simultaneously over the whole surface of society! " But as well as this frontal attack on socialism, Malthusian population theory played an important part in justifying the conditions of the workers in contemporary capitalism. It explained the poverty of the working class and the drudgery of life in the factories. It encouraged the New Poor Law and frowned on private charity. All in all, then, it is not surprising that for his work on population Malthus should have drawn strong words from Marx and Engels.

In *Capital* Marx hits at " Parson Malthus " for his *Essay* " a schoolboyish, superficial plagiary . . . not a single sentence thought out by himself." Engels agreed that Malthus stole his population theory " like all his other ideas " from his predecessors, but gave him some credit for recognising that unemployment, poverty and an apparent surplus of population could be caused by a shortage of purchasing power and increased mechanisation. In Malthus' presentation, however, demand deficiency and mechanisation were temporary, minor, supplementary causes compared with his " principle " of population. But to Marx and Engels they were the permanent and complete explanation of the poverty of the working class in capitalist society. In these selections they explain how competition forces the capitalist continually to search for new techniques, which are normally capital intensive. Any given stock of capital therefore requires less and less labour to operate it. The stock of capital is rising with accumulation, but the relative demand for labour is falling; at the same time the supply of labour is increasing with a rising population and the displacement of peasants and craftsmen. The result is growth of the reserve army, the pool of unemployed, which expands and contracts over the trade cycle, but whose existence is a

fundamental feature of capitalism. It is the reserve army which weakens the bargaining strength of the workers till their real wages are reduced to miserable levels. Thus capitalism means unemployment and poverty for the labouring masses and gives the illusion of overpopulation and of a pressure of rising population on inadequate food supplies which Malthus tried to justify as an " eternal necessary " because of diminishing returns in agriculture.

But the true cause of poverty is capitalism not population, and diminishing returns are a Malthusian myth. The potentialities of science and the unexploited resources in agriculture and industry are boundless, and they could offer a continuously rising standard of living to a sharply rising population, but only a socialist state could realise these possibilities. Continued capitalism will always see poverty for the masses and a large pool of unemployed labour. In rejecting the Malthusian " law " of population, in which mankind is continually outstripping subsistence, Marx and Engels nearly create another " law " in which science continually outstrips population, but not quite. As always, they refuse to recognise " laws " which are to be valid under all conditions, and in all societies. Engels admitted that he could conceive of a period when the increase in population threatened to be too great and when some limitation would be desirable. But only in a socialist society, accustomed to planning, would it be at all easy for the State to decide when that day had arrived and how the limitation should be instituted. Certainly Malthus' " moral restraint " would only be a practicable solution in such a socialist society when the whole population would be educated and accustomed to good living standards.

The selections on " Marx on Malthus and Economic Theory in General " cover three topics: " Malthus on Rent "; " Malthus' Theories of Value and Profit "; and " Malthus on Over-production and Over-consumption."

Malthus' work on rent was, in Marx's view, all of a piece with his work on population: more " shameless and mechanical plagiarism " and more " falsification of science " by the " bought advocate " of the ruling landed aristocracy. He attacked him for stealing the theory of rent from Anderson and then perverting it to reactionary purposes. Marx argued that Anderson correctly ascribed rent to the differentials in fertility existing at any one time and not to the absolute levels of fertility. Far from assuming diminishing returns over time, Anderson supposed that scientific progress will result in the opposite. Malthus took this theory, converted it into one of falling yields per man and used it to support both his theory of population and his plea for protective tariffs for the land-owning classes. It is this partisan use of economic theory to support the interests of a reactionary class which Marx called " falsification of science." In this Malthus was contrasted with Ricardo, who was praised for his preoccupation with increasing total output regardless of who was hurt or favoured. In an interesting aside, Sismondi was reprimanded for his concern with individual welfare. Marx argued that progress in its early stages is always at the expense of the majority. " The higher development of individuality can only be purchased through a historical process in which individuals are sacrificed."

The section on Marx on the Malthusian theory of value and profit sees Malthus once again in disgrace compared to Ricardo, this time for being superficial, for approaching value as an exchange phenomenon instead of an expression of real costs and of social relationships. By doing this Malthus hides the existence of exploitation, and he disguises the true nature of profit. In Marx's view Malthus starts by " presupposing " the existence of profit, which is then added to the labour content to get the exchange value. This makes it appear as though the labourer receives the due reward for his work and that profits do not arise from exploitation, but are the payments for work done by another necessary factor of production. As Marx puts it, " What Malthus does not understand is the difference between the sum total of labour contained in a commodity and the quantity of paid labour in it. It is precisely this difference which constitutes profit."

In " Malthus on Over-production and Over-consumption " Marx gives him some credit for recognising that there were contradictions in capitalism which could lead to crisis. But the applause is restrained, for again he is accused of having plagiarised the idea, this time from Sismondi, and of perverting it to reactionary ends. In Malthus' analysis the wages of labour must remain low both because of the pressure of population and because low wages are the only thing which keeps the worker industrious. Profit must be kept high enough to encourage accumulation. Yet accumulation means increased output, which cannot all be sold to the workers because of their low wages. Since wages cannot be raised, this gap in effective demand can only be filled by a class of consumers who receive incomes but do not produce goods. Specifically, in England this means landlords and their retainers, Civil Servants, the clergy and rentiers living on National Debt interest. If capitalism is to expand smoothly the consumption of this unproductive class must expand side by side with accumulation, or demand deficiency crises will emerge. In short, Malthus sees as permanent and natural a society in which the industrious poor must be kept poor and industrious and the idle rich, rich and idle. Marx was able to be very sarcastic at the " parson " for this " solution."

The selections conclude with Marx and Engels on " Malthus and Darwinism "; a surprising choice, for the topic seems unimportant compared with the others. On Darwin, Marx and Engels were in two minds. They admired his " excellent work," which emphasised the evolutionary character of all of nature, including mankind. But they hated Darwin's praise of Malthus and his claim that the " struggle for existence " and " natural selection " in the organic world was but a generalisation from the Malthusian concept of the continuous pressure of population on subsistence in human society. So in these selections we find Marx and Engels attacking Darwin on two fronts. First, they deny that " the struggle for existence " is a true description of life in the plant and animal world. Secondly, they argue that even if it were a true description it is improper to transpose rules which apply to those worlds to the analysis of human society.

In his introduction to these selections Dr. Meek gives a brief outline of the

historical setting of Malthus' work, a summary of his arguments and an analysis of the criticism by Marx and Engels which the selections illustrate. This last is most useful, for some readers will find it hard to pin-point the arguments amid the florid and repetitive style. The concluding section of Dr. Meek's essay is entitled " Malthus Today," and in it he gives us his view of the roles that Malthusian theories are now playing and the reason why this republication of the Marxist counter-arguments is timely. To-day, he states, the Malthusian population theory is used in capitalist countries to justify conditions in Asia and in colonial areas. Apologists claim that population presses inexorably on subsistence, and the people are necessarily a prey to famine and disease. Increases in output are bound to be swallowed up by increases in numbers. Since no amount of independence can solve this dilemma, there is no reason to grant it. Another side of Malthusiasm also has a part to play. The theory of effective demand, in its modern Keynesian form, serves to justify expenditure on armaments as the only form of government expenditure which can possibly be large enough to ward off the slump. Put these two sides of Malthusianism together and you have the justification for imperialism and for the arms race. But this is not all. If the Asian and colonial peoples are bound to die wretchedly from famine and disease, the idea of using the arms on them in another war does not seem so terrible. Since Dr. Meek has carried his arguments this far, it is not surprising that he should conclude with the cry: " The struggle against Malthusianism is an integral part of the struggle for peace in the world today."

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General Union: A Study of the National Union of General and Municipal Workers. By H. A. CLEGG. (Oxford: Basil Blackwell, 1954. Pp. xiv + 358. 27*s.* 6*d.*)

MR. CLEGG's book provides a clear and eminently readable account, derived from first-hand investigation, of the present structure and government of the National Union of General and Municipal Workers. The forces and methods which brought together various unions to form the present amalgamation are touched upon more lightly, but sufficient account is given to provide the essential background. The description of the union's share in wage negotiation in a selection of the many industries in which it operates is in one or two cases rather too sketchy to afford much of interest in itself. But, taken as a whole, the account given of the part the union plays in these industries is of value in assessing the methods which the union has pursued and the degree of success they have achieved.

The union possesses certain features in its organisation and methods which distinguish it from most other unions. Notable among these is the system by which branch secretaries are paid commission which may enable them to devote their whole time to the work of local organisation. Large

branches here, as elsewhere, are poorly attended, but the work of whole-time branch secretaries may provide an effective link between members and the official machinery. The emphasis which the union places on district organisation is also interesting, and the power of district secretaries has tempered the modern trade-union tendency towards central control. On the whole, however, the main interest of the book lies in the study of general unionism as a method of organisation and in comparisons with the Transport and General Workers' Union.

It is undoubtedly the case that the main obstacle in the way of industrial unionism is the existence of the general unions, and they have been active in opposition to proposals for achieving it. They were a historical necessity for the growth and development of the trade-union movement. The author presents also a reasoned case for their continued existence. But his strongest argument is that they *will* continue to exist " since there is no likelihood that the general unions will disband and no one has the authority to break them up, or seems likely to gain that authority." Turning to comparison with the Transport and General Workers' Union, it is often puzzling to determine why, despite certain very obvious similarities between the two unions, their industrial experience in certain industries has been so dissimilar. Both unions were established as amalgamations in the early 1920s, and for a time had membership figures of the same order. The greater growth of the Transport and General Workers' Union was no doubt to some extent the result of the dominating personality of Mr. Ernest Bevin. It was influenced even more, however, as Mr. Clegg shows, by the predominating trade-group structure of that union which has made it easier for it than for the National Union of General and Municipal Workers, with its emphasis on district structure, to absorb other unions with a national coverage. Both unions have, certainly in recent years, been on the right wing of the trade-union movement and definitely anti-Communist in policy. The pursuit of this policy by the National Union of General and Municipal Workers has, however, been rather more a question of practical trade-union administration than openly avowed and pugnaciously pursued intention; it does not seem to have exposed itself to the same open counter-hostility as has the Transport and General Workers' Union. And it is here perhaps that we may find the real reason for the more tranquil passage which the National Union of General and Municipal Workers has enjoyed in recent years, particularly in industries such as docks and road transport, in which both unions participate in collective bargaining. The successes of the latter union are particularly notable in cases where the industry—or the section of it which the union organises—is well delimited by district. The method of decentralisation, which is by district in this union, has better fitted it to deal with matters on a district than on a national basis, whereas the opposite is the case in the Transport and General Workers' Union.

The policy of the union is fairly summed up by the author as being that of " business unionism "—the business, as one officer of the union has put it, of selling labour and getting as good a price as it can which, as in other business,

involves keeping on good terms with its customers. Certainly the policy of the union, while loyally co-operating as part of an industrial and political labour movement, has been singularly free from doctrinaire prejudice.

Attention may be drawn to a few factual errors in the book. It is not correct (as stated on p. 106) that lawyers cannot appear before "departmental tribunals" to handle cases under the National Insurance (Industrial Injuries) Act, 1946. Claimants under that Act are entitled to be legally represented before the Commissioner and, with the consent of the Chairman, before the local appeal tribunals. The leaders of the North London gas strikers in 1950 were not (as stated on p. 164) "arrested"; they were served with summonses. To state (as is done on p. 288) that the miners "allow" a representative of the North Wales Quarrymen "to sit for one of the seats in their group" in the General Council of the Trades Union Congress is surely wrong. The voting is by secret ballot, but, so far as the declared figures of the voting show, it would certainly appear that it is despite the opposition of the miners that a representative of the North Wales Quarrymen sits on the General Council.

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Judges in Industry: A Study of Labour Arbitration in Australia. By M. PERLMAN. (Melbourne: Melbourne University Press (London: Cambridge University Press), 1954. Pp. xviii + 219. 37*s.* 6*d.*)

THIS book consists of an introductory section dealing with the Australian arbitration system as a whole, three more detailed studies of its application to particular industries and a final section contrasting the role played by the Arbitration Court in two specific disputes in 1929 and 1949 respectively.

Throughout, the author seeks to distinguish between two conceptions of arbitration which he describes as "administrative" and "autonomous." The first conception regards arbitration as an instrument of public policy, economic control and quasi-legislative economic planning. The attitude of its proponents might perhaps be summarised in the statement, quoted by the author, of one of the Arbitration Court judges, who referred to himself and his fellow justices as the "economic dictators of Australia." The second conception of arbitration is a much more limited one. The initiative is left to the parties—to employers and workers and their organisations; the function of arbitration is more judicial than legislative; it provides a seat of judicial review to which the parties may repair when they cannot reconcile their divergent views.

The interesting suggestion emerges that autonomous arbitration, being judicial in its approach, tends to become legalistic in its methods and dilatory in its handling of disputes. It is difficult to see, however, why an arbitration system, merely because it does not set itself up as an instrument of economic policy, should regard its functions as narrowly judicial. In any system of industrial arbitration, of interests as distinct from rights, the arbitrator is

more often a law-giver than a law-interpreter, more often the propounder of a practical solution to the immediate problem than the discoverer of hidden truth by means of legal procedure and in the mysteries of legal precedent. That, at any rate, seems to have been the view of the Labour Government in 1947 in its amendments of the Arbitration Act and, in particular, in welding on to it a system of conciliation commissioners. Dr. Evatt, the Attorney-General, said in the second reading debate at that time:

> "The system of industrial regulation cannot be properly administered without impartiality, disinterestedness, and a strong sense of justice; and these qualities should be, and usually are, developed by a legal training and judicial habits. But it is a profound mistake to think that these qualities, and especially the judicial temper, can be exhibited only in courts of law or in the application of ordinary legal techniques and procedures."

The notable fact emerging from this book is the different degree of success which the Australian arbitration system has achieved in the three industries, the pastoral industry, the metal trades and stevedoring, which are here separately studied. The careful analysis which the author makes of these industries and their organisation and development in Australia suggests many reasons for that different experience. There is perhaps, however, one more fundamental reason than all—that no system of regulation of industrial relations can be surely based except on the consent of those whose conduct it seeks to regulate. This is a point which is confirmed by the remark of Mr. R. M. Eggleston, Q.C., in the foreword which he contributes to this book that, although arbitration in Australia is compulsory and "a method of prescribing for the parties a rule of conduct imposed on them by a superior authority of a quasi-legislative character," yet it must be realised that "the effectiveness of the Court's operations depends to a large extent on persuading the parties that the long-term advantages of arbitration outweigh the immediate disadvantages of an unfavourable decision."

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Federalism, Finance and Social Legislation, in Canada, Australia and the United States. By A. H. BIRCH. (London: Oxford University Press, 1955. Pp. xiv + 314. 35*s*.)

MR. BIRCH sets out to show the major episodes in the development of financial relations between the federal and unit governments in the United States, Canada and Australia. He starts with three "country" chapters showing the development from the beginnings of federation to the end of the Second World War. Then he has a chapter which is primarily theoretical but well illustrated with examples on the basic principles of federal growth. Subsequently he turns to problems of social legislation and spends four chapters on this, one on the constitutional problem and the other three devoted to the individual countries. A summary chapter concludes

the major part of the book, but there are two final chapters, one dealing with the post-war developments in his three countries and another outlining some of the constitutional arrangements in the new Federations of to-day and to-morrow—India, Central Africa, Nigeria, the West Indies.

Mr. Birch has read deeply in his field and has brought together a good deal of information which is otherwise not easily accessible and, even if it is accessible, usually unreadable. It is all too rare to find anyone who is capable of moving easily from the more purely constitutional to the more purely economic problems in this borderland territory. Moreover, he carries his learning lightly and is able to summarise the major points of his arguments succinctly and clearly.

One's chief worry is whether he has not attempted to cover too wide a field. It is stated on the dust-jacket that the book " began as a history of inter-governmental financial relations " but " developed into a comparative analysis of the problems of federal finance in relation to other problems of twentieth-century federal government." The result of this process of growth is that the book loses a good deal of the unity which it might otherwise have had. In effect, there are two major themes—Federal–State relations and social legislation—which do not have a very strong connection. And the quick summary of recent legislation in other countries, although extremely useful and interesting, really opens up still another field.

One or two slips may be noted. It is surely wrong to say (p. 296) that before 1946 the Legislative Council in Nigeria had no jurisdiction over the northern part of the country. And the argument (p. 38) that the Australian federal constitution accepted the principle of compensating the States for revenues lost through federation hardly seems to square with his detailed description of the arrangements, from which it would appear that federal grants were based on the derivation principle. Only in the case where the distribution of customs duties by States after federation was not different from that before federation would the two principles be the same.

But these are minor points. Mr. Birch has produced a most interesting and readable book.

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Soviet Industrial Production, 1928–1951. By D. R. Hodgman. (Cambridge, Mass.: Harvard University Press, 1954 (London: Geoffrey Cumberlege, 1955). Pp. vii + 241. 40*s*.)

American research on the Soviet economy has shown a quite imposing output-record in the past decade. Aided by a richer and more systematic collection of source material than is available over here, it has reaped the benefit of some large external economies. Yet its location in that country has not been without disadvantages. Inquiry and its results have not remained unaffected by the prevailing cold-war atmosphere; and writers have been at pains to show that they study as critics, untouched by sympathy

with their subject. This obsession has bedevilled the discussion of Soviet output-statistics; charges of bias in the so-called " constant prices " in which output is expressed being so emotively overlaid as to make it difficult to reach a clear picture of the actual position.

At first this charge of bias rested on the choice of an early year (1926–27) in which the price-structure favoured those products that were to show the most marked increases of output during the 1930s. This was, of course, the familiar Paasche–Laspeyres discrepancy (a discrepancy which has been shown by Gerschenkron to apply at least as much to a comparison of American engineering output in 1899 and 1939 as of Soviet engineering output in 1928 and 1937). More recently the charge has rested on the treatment of new products: these were said to have been introduced into the index (at any rate up to 1936) at current, and hence inflated, prices. This is the criticism on which Professor Hodgman focuses attention. The trouble is that such evidence as we have refers to the form in which industrial enterprises were instructed to make their returns; there is no evidence to show whether these returns of new products at current prices were or were not treated at a higher administrative level to deflation by a price-index of comparable products before being embodied in the output-index (in one or two special cases only, including producers' co-operatives, one knows that this *was* done even prior to the change of practice in 1936—see p. 6). Professor Hodgman does, however, produce at least two quotations from Soviet writers (pp. 15–16) which seem to indicate fairly conclusively that the treatment of new products introduced at least *some* measure of inflation into the index, possibly even after 1936 as well as before; moreover, he claims that analysis (by years and by industries) of discrepancies between his own index and the official one supports this criticism.

The positive contribution which Professor Hodgman has made is to produce an output-index of his own—a year-to-year index using wages and salaries (including social insurance contributions made by industries) in 1934 as weights (these he speaks of as " value-added weights "). In other words, he has measured output in terms of its wages-cost per unit in a single year instead of in the industrial selling-price of a single year. To this end, with much skill and ingenuity, as well as great industry, he has pieced together an impressive amount of data on output, wage-rates and employment from a variety of sources (including specialised industrial and technical journals). The data on which the index is based cover 137 separate products (seventy-six of them items of machinery); and these either directly or through the industry-weights assigned to them (after correcting for coverage of the industry) cover some " 71 per cent of industrial output in the official index" (and some 56% of " the net-value added in industry in 1934 "). This is a signal achievement. The result is to show an annual rate of growth of industrial output from 1928 to 1937 of about 14% (which, as Professor Gerschenkron comments in his Preface, is " a very high rate by any standard "), or for the decade as a whole slightly less than a fourfold increase, as against an increase of five and a half times shown by the official index.

Undaunted by the difficulties involved, the author has extended his index beyond 1937 on the basis of much more slender data (twenty-two products for 1940 and 1946–50 instead of 137; eighty-nine from the 1941 Plan but only eighteen for 1951). With gaps for 1938–39 and 1942–44, the index is continued up to 1951. Here the discrepancy between his results and the official index is somewhat larger (most of it applying to the war and the immediate pre-war years); his index showing only a doubling of output between 1937 and 1951 as against an increase of three times according to the official index.

Professor Hodgman is much less successful in the way he presents (in Chapter 2) a theoretical justification of his method than in his actual handling of the method and his careful and detailed account of it. In the form in which it is presented, at least, this prefatory justification seems to the reviewer confused. The author wisely rejects the method of valuing a country's output in the quite different price-structure of another country. But in discussing the best way of weighting Soviet output, he feels it necessary to cast the problem in terms of a contrast between an economy ruled by "consumers' preferences" and one ruled by "planners' preferences." He holds that in the former case output can be significantly valued at market prices, since "equal value units" represent "equal amounts of consumer satisfaction." Despite a passing reference to "shaky theoretical underpinnings," he adopts this view rather naïvely (*e.g.*, ignoring income-distribution difficulties when some things are consumed only by the rich), and treats it, apparently, as being true of investment as well as of consumption. He does not seem to see that this would also justify valuing Soviet output (consumers' goods at least) at retail prices (*i.e.*, including turnover tax), since the equality of the ratios of marginal utilities and of prices (for each individual) can apply at *any* set of prices provided consumers' spending is free—formally it is no more than a tangency-condition of some indifference-curve with the price-line. (If there are to be no unsold stocks or queues, then the condition is also needed that prices are responsive to demand.) The real reason for not adopting this course is that there is no comparable basis for valuing capital goods. But the author does not give this answer in so many words. Instead, he rejects valuation at market prices on the ground that "the bill of goods produced is determined by planners' preferences rather than consumers' preferences," and comes down in favour of factor cost on the ground that "factor prices are determined in a system of interlinked factor markets . . . and therefore are comparable in different industries" (in what sense comparable being left unexplained). After profits as a Soviet category and turnover tax have been excluded because they do not correspond to something called "entrepreneur-type profits," the conclusion is reached that in the circumstances salaries and wages afford the most "appropriate value-added weights for the output of a given industry." Would it not have been better to cut this sophistication and simply to say that valuation of output at wage-cost is the most practicable in view of the data available, and at least makes sense as a way of measuring the changed product of human

effort, provided that wages mean roughly the same thing (as regards effort rewarded) in different industries? We should have had no less respect for Professor Hodgman's results if he had said no more than this.

But this unhelpful excursion into index-number theory is no more than incidental. The real value of the book lies in the interest of the results obtained and in the wealth of data embodied both in the text and in the appendices (the tables embodying the basic output and wage-bill data alone occupy nearly thirty pages). Adoption of the growing American habit of relegating footnotes to the back of the book makes the checking of sources and references as one reads a tiresome, even exasperating, business; but for that presumably publisher and not author is to blame.

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Changing Melanesia. Social economics of culture contact. By C. S. BELSHAW. (Wellington and London: Oxford University Press, 1954. Pp. ix + 197. 17*s.* 6*d.*)

THIS is a book that will fascinate many kinds of readers, economists, anthropologists, social scientists generally and, of course, those concerned with the practical problems of colonial administration. It is written by a trained economist who spent a number of years in the Colonial Service in the Solomon Islands and was able to study at first hand the material on which anthropological studies are based.

Ostensibly the purpose of the book is to give an account of what happens when Western and Melanesian societies meet, how the cultures influence one another, and to trace as far as possible the interactions of social, political and economic forces. In fact, the story told is so very systematic, and so well organised with the help of theoretical concepts, that the reader cannot but be impressed by the evidence it gives of the advances that have in recent years been made in the social sciences. On the economic aspects the more senior readers of this JOURNAL, in particular, will recall the discussion of rather similar material by Malinowski in 1921 on his return from the Trobriand Islands (though he was more specifically concerned with the economics of a static primitive society). Since that date much information has been collected on the economic organisation of various primitive peoples, and this material has been compared and, to a certain extent, interpreted in a number of compendia of primitive economics, the most well known of which are by Thurnwald and Herskovits. As a result, Dr. Belshaw is able in this work to set out his findings with a notable brevity, emphasising points of general and theoretical interest, and avoiding those lengthy descriptions of canoe building, and the like, which absorbed so much space in earlier writings.

From the point of view of the general economist, anthropological studies suggest a number of questions. First, are all peoples at all times faced with an " economic problem "? The earlier view that primitive peoples lived at

a pre-economic stage has now been replaced by the view that the economic organisation of these peoples is rather more closely linked with their social and political systems than in Western societies; it is only possible to consider the economic aspects of their society by a fairly stringent process of abstraction. An important reason for this is that in a stationary economy (that is to say, stationary in both techniques and population level) the solution to the economic problem—once it has been found—will apply for all time. Economic questions, such as the number of yams to produce each year, become a matter of habit or routine and there is no need for any mechanism—such as that provided by a competitive economy—to balance more yams against fewer canoes, provided of course that tradition is exactly followed.

A second question is, to what extent is economic gain the primary purpose in the exchange of goods? Malinowski's well-known description of the highly ritualised annual exchanges among a circle of islands in the Western Pacific naturally led to a considerable discussion of this question; in his essay on *The Gift*, recently translated into English, Mauss argued, broadly speaking, that the exchange of goods may take place even though the material utility (if one can so designate the utility concept used in economic theory) of the two parties may not be improved by the exchange. The purpose of the exchange is to establish trust and confidence between the parties: the exchange is not necessarily simultaneous but may be based, to use Belshaw's term, on the " custom of ultimate reciprocity." The inference is that it is only on the basis of such material changes that societies can be founded. Particularly interesting in this connection are the reports of missionaries, quoted by Belshaw on p. 51, that before any contact on a higher level was possible the missionaries found it necessary to trade with the natives.

It is on theoretically fundamental matters such as these that the economist can derive much insight from anthropological studies. The colonial administrator, in addition, is somewhat in the position of an experimental social scientist; his decisions on the rate and methods of economic progress can be guided by theory, and their consequences may be used in constructing new theories.

In Chapter X of this book, entitled " Social Change in Theory," Dr. Belshaw sets down his views on such theoretical matters. This chapter is, more or less, an inventory of logical categories according to which data may be organised; a number of these categories—the elasticity of demand for a social end, the complementarity of social ends, etc.—are taken over from economics. It may well be that sociologists and anthropologists would benefit from the use of the logical schemes and tools that have been found useful in analysing economic problems; the case made out for their use in this chapter is, however, not entirely convincing.

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West Highland Survey. Edited by F. FRASER DARLING. (London: Oxford University Press, 1955. Pp. v + 438. 30*s*.)

THE crofter is bound to be a problem child of social students, as of men of affairs, because his life is essentially and inevitably unstable. He has his land holding, which is as good as his own property, though technically he is for the most part only a tenant, a fact which may matter if when he dies he has no heir to take on the hereditament. But the holding is not large or wealthy enough to maintain him and his family on even the most modest standard of living, and he usually undertakes some supplementary part-time occupation, which may be anything from weaving or fishing to acting as local agent for a cattle-food combine or as a part-time worker in a nearby factory. It is an untidy way of life, and one can understand that reformers urgently want to improve it. Equally understandably, their first reaction is to demand increased emphasis on one or other of the crofter's two types of occupation. That is to say, they are in favour either of converting the crofter into a full-time farmer, of one kind or another, or developing new industries in the Highlands and Islands (including electricity schemes and the tourist trade) so that a large part of the inhabitants can be taken off the soil. The two solutions are not, of course, incompatible; theoretically at least one could divide the population of the Highlands into two sections, one dealing with an extended range and volume of non-agricultural economic activities, while the other devoted itself to farming on a larger and more efficient scale than is the rule at present. The difficulty is that apparently most crofters, though dissatisfied with their present standard of life, are reluctant to give up altogether either their holdings or their non-agricultural work. They like having one foot in each of the two camps, and are as bitterly opposed to far-reaching change as any Russian peasant was to collectivisation.

All this is, of course, well known to Dr. Fraser Darling and his colleagues. They have produced a truly impressive conspectus of the situation as it is, area by area, even parish by parish. The problem is studied closely and understandingly from the points of view of geography and geology, population, agriculture and sociology, and its findings on the factual side are (so far as I can judge) wholly reliable. But the conclusions superimposed upon them are perhaps affected by predilections.

Dr. Darling sees the future of the Highlands in making the fullest possible use of its existing agricultural and marine resources. Under the former head he lays chief stress upon continued reafforestation (with which everyone will agree) and the increase of cattle stocks at the expense of sheep (about which there is perhaps more room for argument). He evidently dislikes the idea of bringing industry to the area (indeed, it is a surprising omission in the book that it does not survey such industrial undertakings as already exist); he does not attach much importance to tourism; he even wants to discourage the building of roads, lest it make it too easy for the crofter to visit urban centres, whereby he might lose his attachment to the croft and the local township.

Instead, he wants to build up the township as a well-equipped social and human centre offering the means for a full and happy life to the occupants of the surrounding farms. I find myself torn by conflicting doubts. First, will the crofters themselves accept this streamlining of their lives? Only, I think, if they are " feather-bedded "—offered the facilities suggested by Dr. Darling, *not* refused the improved communications which he on the whole deplores and allowed at the same time to carry on their present straddling way of life. Given that the country is prepared to face the cost involved in this programme, one can imagine that it could fulfil the hopes pinned on it by enthusiasts for the Highlands and Islands. But one can ask whether it is reasonable to expect England and Wales and the Scottish Lowlands to accept the Highlands and Islands as a permanent financial liability. If, however, this is reasonable, if we regard the area as a national asset, worth preserving even at some cost to the Treasury, then at least let us make it as easy as possible for southerners to enjoy it; in other words, let it be developed as an area for discriminating tourists. And finally, while I am among those who dislike the idea of establishing anything in the way of large-scale industry in the Highlands or Islands—a project which would, of course, do nothing to solve the crofter problem, though it might raise both the total population and the *average* standard of living in the area—yet I find it unreasonable and unrealistic when people oppose the full exploitation of the area's biggest single natural asset, its water power. I am all for hydro-electrical schemes, in spite of the pylons and the threat to some trout streams.

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NOTES AND MEMORANDA

THE INDUSTRY AND THE REPRESENTATIVE FIRM

In a recent article in this JOURNAL [1] Mr. J. N. Wolfe has made a valiant attempt to revive the concept of the "industry" as a tool of economic analysis. He defines an industry as those firms "involved in a chain oligopoly (which) operate as though their demand curves had a kink at the prevailing price." [2] He goes on to argue that the supply curve of such an "industry" may be drawn with reference to the costs of production of a "Representative Firm," [3] the latter being defined in Marshallian terms.[4] Mr. Wolfe then proceeds to draw certain conclusions regarding the size distribution of firms within such an industry, which, he maintains, is governed by the output of the industry and the price at which its products are sold.[5]

Any attempt to reconcile the views of those economists who regard the "group and the industry as useless concepts" [6] and those of businessmen, who still seem to think and act as if there were such things is to be commended. The need for a precise and meaningful definition of an industry has long been apparent to those economists interested in empirical research or in welfare economics. But Mr. Wolfe's attempt to put the clock back in economic analysis and to apply concepts once useful in a certain economic environment to an almost completely different environment raises considerable difficulties.

It seems clear from a reading of the *Principles* that Marshall's industry was based, implicitly at least, on the criterion of technological similarity. Despite Mr. Wolfe's liberal interpretation of Marshall's "free competition" as implying merely that one price shall rule for one product at a given time in any market,[7] Marshall's industry was composed of large numbers of firms producing technologically similar products possessing high elasticities of substitution. Such a definition can be regarded only as a first approximation, and Marshall himself was not unaware of the intricacies of the concept.[8] Where product differentiation is introduced into the analysis the criterion of substitutability is much more relevant. Here Mr. Wolfe abandons Marshall and, following Kaldor,[9] he seems to envisage a chain of

[1] "The Representative Firm," ECONOMIC JOURNAL, Vol. LXIV, No. 254, June 1954, pp. 337–49.

[2] *Ibid.*, p. 342. [3] *Ibid.*, p. 346.

[4] A. Marshall, *Principles of Economics*, 8th Edition (London: Macmillan, 1920), p. 317.

[5] J. N. Wolfe, *op. cit.*, pp. 346–8.

[6] R. Triffin, *Monopolistic Competition and General Equilibrium Theory* (Cambridge: Harvard University, 1940), p. 89.

[7] J. N. Wolfe, *op. cit.*, p. 341.

[8] *Principles*, 8th Edition, p. 100, note 1.

[9] N. Kaldor, "Market Imperfections and Excess Capacity," *Economica*, N.S. 11 (1935), pp. 122–36.

substitutes surrounded on all sides by a marked "gap." The industry is composed of firms contained within this "gap."

The main difficulty with the substitutability criterion is that if the definition of an industry is to be at all precise, one has to define what elasticity of substitution is required before a gap may be said to be present. Mr. Wolfe fails to do this and admits the need for further research into the price policies of chain oligopolies.[1] Although business-men as a rule do not take account of the operations of the entire economy, but only of the reactions of a few dangerous rivals, it is axiomatic that in the last resort all commodities compete for a place in the consumer's budget. In the modern economy most firms are multi-product, and their operations may extend over many "industries," so that the "reaction patterns" of oligopolistic firms may cover a very wide field.

As the matter rests, therefore, neither technological similarity or substitutability present a very convincing case for the use of the "industry" as a precise tool of economic analysis. In a complex economy such as exists at the present time and with the prevailing predominance of the large multi-product firm striving to create a differentiated market for its product, economists should direct their attention to the problems and policies of the individual firm rather than to the extremely vague and nebulous concept of the industry.

It is equally useless under modern conditions to attempt to revive the "representative firm." Marshall's representative firm was devised to meet the problems encountered in the analysis of industries composed of large numbers of firms in different stages of development, managed with different degrees of ability and encountering varying degrees of uncertainty and luck.

In such a situation it is useful to postulate a sort of average firm, but it is significant that Marshall never stated clearly whether his representative firm was a business organisation or a single plant or factory. It is probable that he had in mind a small owner-managed firm producing a single product in a market where consumer preferences were evenly spread over the products of the various firms.

An oligopolistic industry, by definition, is one composed of firms large enough to exercise in themselves a positive effect on the market. Under such conditions it is difficult, if not impossible, to characterise any single firm as being representative of the industry either in theory or practice. In Appendix H, Marshall admits that "it is true that when nearly the whole of any branch of industry is in the hands of a few giant businesses, none of them can be fairly described as representative. If these businesses are joined in a trust, or even closely combined with one another, the term 'normal expenses of production' ceases to have a precise meaning." [2]

Marshall postulated an entrepreneur of normal or average ability. Again, this is a useful basis for analysis when the majority of firms were small owner-managed concerns. But in the large-scale corporate undertaking the "entrepreneur" as such is often difficult, if not impossible, to identify.

[1] *Op. cit.*, p. 349. [2] *Loc. cit.*, p. 805.

Control of a large joint-stock enterprise may be vested in different individuals or groups at different times and at different stages in the firm's history. Some firms may even have lost control of their firms to outside financial bodies which may operate the firm on quite different principles to those normally followed. Are we to imagine a representative Board of Directors, a Representative Financier, a Representative Sales Manager, a Representative Engineer, etc.? Moreover, Marshall's entrepreneur was motivated by considerations of profit maximisation alone in his operations. One thing which oligopoly theory has taught us is that a number of non-pecuniary or semi-pecuniary motives may be equally important or even more important than that of profit maximisation. Marshall's analysis of the process of price determination was very largely mechanistic in character. The policy decisions of large oligopolistic concerns are not capable of such simplification—many more variables have to be taken into account.

Mr. Wolfe ends his article with a plea for more research into the price policies of oligopolistic firms and into the theory of the growth of firms. Such research is likely to be more hindered than helped by any attempt to apply concepts which, however useful they were in the analysis of a particular economic model, have little significance or applicability in present-day conditions. To the neo-classicists the problem of price determination was relatively simple; price was considered to be the outcome of impersonal forces. Given these assumptions, an aggregate concept such as the "industry" and an average concept such as the "representative firm" possessed some meaning. No such mechanistic analysis is possible under oligopolistic conditions. The economist studying oligopolistic situations has to estimate and appraise the *subjective* attitudes of entrepreneurs to the price and output policies of an indeterminate number of rivals and to the expected reactions of their rivals to their own price and output policies. In such conditions a more fruitful approach is to abandon the concept of the industry, and with it the need for a representative firm, and look instead at the dynamic development of the organisation of particular firms.

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THE INDUSTRY AND THE REPRESENTATIVE FIRM: A REJOINDER

Mr. Davies' comments on my paper seem to me to call for an examination of the reasons for the development of a theory of the firm. There are two principal uses for such a theory. First of all, it can provide us with a picture of some aspects of the behaviour of firms under selected stimuli. In this case a considerable measure of abstraction is obviously essential. On this view of the theory of the firm the theory is only useful *because* it is a simplified account; the ease with which we can make deductions from

simple models is the justification for the theory. The amount we leave out ought to depend entirely on the sort of deductions required. This type of theory of the firm has received much attention in the last thirty years, and I have nothing to say about it here.

There is, however, another reason for developing a theory of the firm. It may be useful as " a guide to an entry on problems of life." Here the theory is not used as a basis for deduction. It is instead a means of familiarising the student with the main elements influencing the position of the firm in the real world. In an investigation of some specific case there is no substitute for a detailed examination of the facts of the situation. But it would be unnecessarily harsh to insist that each situation should be approached altogether without preparation. To descend to an analogy: the fact that every hill presents problems of its own and is slightly different from every other hill is not generally regarded as a sufficient reason for abolishing all general instruction in ski-ing. Similarly, the fact that every firm and every industry have slightly different problems to face does not make a general study uninformative. It is this type of general study which Mr. Davies and I have in mind, I think, and it may be useful to consider what characteristics it ought to have.

In selecting between competing theories at this level, the real test should not, it seems to me, be whether they introduce the greatest number of the elements of any practical problem. There is at least as much need for clarity and simplicity in our theory as for precision. Nor should we insist that there be sufficient generality in the analysis to cover all possible cases. A really general theory is always useful for categorising exceptional situations, but it is not usually very helpful when we start on a new study. It is, to return to our analogy, like insisting that our would-be skier direct all his attention to the theory of mechanics. My feeling is that what one wants is a theory that concentrates on the main features of certain typical situations in the real world. Such a theory requires amendment in most situations and amplification in all, but it does at least prepare the student for the most important difficulties he is likely to encounter.

From this point of view, the disagreement between Mr. Davies and me can be seen to be over what are the really important elements of the typical industrial situation. Mr. Davies thinks that the world has now moved on to a stage in which each industry has fallen into the hands of a very few large quasi-monopolistic firms controlled not by any one man but by a self-perpetuating board of directors. In my view this account pays too much attention to the form of industrial structure and not enough to its substance. It is by no means clear that to-day's large firms are not in competition with a considerable number of rivals (home and foreign) in most of their product lines. Nor is it clear that these large firms provide the dominant cases, or at any rate the most interesting ones, in the economist's laboratory. Nor would I agree that the board of directors has really solved the problem of the ageing entrepreneur: great corporate enterprises may seldom die, but they often stagnate, as Marshall pointed out.

Another difference between Mr. Davies and myself is over the question of the advisability of formulating " mechanistic " solutions. I do not myself think that price under oligopoly is determined in any straightforward or mechanical manner. But I think it very useful to show the elements of mechanism which enter into its determination, and to show at which points human fallibility and human discretion may move the balance in one way or the other.

I would finally call attention to the fact that Mr. Davies' appeal for further study of the individual firm comes after two decades of such study have already taken place. The existing theory of the individual firm seems to me to have failed as a guide to an entry on problems of life precisely because there has been too little study of the industry.[1] When we examine the price policies of the individual firm we almost invariably find that they are influenced chiefly by its environmental conditions—by the industry, that is, of which it is a part. Unless we study the firm as part of the industry we are apt to miss its essential character—that is something which Marshall knew but which we are only painfully rediscovering.[2]

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ECONOMIC GROWTH IN TWO DOMINIONS

IN an article published in the ECONOMIC JOURNAL in September 1952 [3] I examined some of the characteristics of the rate of growth of labour productivity within the Canadian economy. Since then, in their respective notes in this JOURNAL, Mr. Lerdau claims to have applied similar methods to the New Zealand economy, and Mr. Pentland has criticised the validity of my findings on Canada.[4] The present note is intended to defend my previous method of analysis, which has not been understood by Mr. Lerdau and is undervalued by Mr. Pentland.

[1] At one point Mr. Davies seems prepared to criticise my formulation because I do not define the size of the gap in substitutes which I regard as sufficient to mark off an industry. This raises a problem of some general interest: must there be numerical precision in the definitions used by economic theorists? I do not myself believe that it is very helpful for the theorist to give a precise definition of terms like firm or industry simply because the definition ought to depend on what the principals in the problem concerned think appropriate. Thus " the industry " will vary from time to time, and from the viewpoint of one firm or another. It seems to me to remain a useful concept, and we must beware of usurping the statisticians' task of close and arbitrary delimitation.

[2] It is extremely difficult in writing on the development of contemporary economic theory to do justice to all, or even most, of those who have contributed to the final shape which the theory has taken. My apologies are, therefore, due to many people. But there is one omission which I cannot pass over so lightly. On p. 338 of my article I said that there had not been " any really determined opposition " to the attack on the representative firm. This does less than justice to Professor Robertson's remarkable article in " Increasing Returns and the Representative Firm: A Symposium," ECONOMIC JOURNAL, Vol. XL (1930), pp. 80–9.

[3] " Productivity in an Expanding Economy."

[4] E. Lerdau, " Changing Productivity in the New Zealand Economy," March 1954, and A. C. Pentland, " Physical Productivity in Canada 1935–52," June 1954.

I

Mr. Pentland's main criticism is that my measure of productivity in the economy as a whole, *i.e.*, real G.N.P. per man hour, is subject to statistical and conceptual difficulties, which make it a misleading [1] indicator of economic progress, and he therefore prefers to abandon it and to try to assess Canadian economic growth by measuring productivity in the mining, manufacturing and agricultural sectors alone. He claims that these sectoral measures are free of the difficulties attached to the overall measures. It seems to me that he exaggerates the difficulties of overall measures, and ignores completely the shortcomings of his measures for individual sectors. He rightly points out that the G.N.P. aggregate includes sectors of the economy in which it is extremely difficult to measure output in real terms, and that it is often necessary to assume that productivity in these sectors is constant, *e.g.*, in services or construction. I do not deny that this is a difficulty, but similar assumptions often have to be made in measures to smaller sectors of the economy, and their proportionate importance in these sectors may not be much less than in the case of G.N.P. In Mr. Pentland's measure for manufacturing, for instance, 16% of the weights in the output index are made up by employment indicators,[2] although he does not warn his readers of this. The difficulty is therefore one of degree, and is not in itself an insuperable objection to the acceptance of either my productivity indicator or of Mr. Pentland's. There is a common form of hypocrisy about measures of output which are partly made up of employment or man-hour data or other indirect indicators. They are often accepted as a reasonable approximation, especially if such indicators form only a small part of the aggregate. However, people who accept such assumptions in output measures will often baulk when they are used in measuring productivity. If the man-hour figures for the activity concerned contain additional errors, then the error in the productivity figure will be greater than in the output figure. If this is not the case, the productivity estimate will be as good as the output estimate, and if the output estimate is the best one available, then the productivity estimate has a right to similar respect.

Mr. Pentland contrasts the vagueness of the output concept of G.N.P. with the reliable and precise qualities of his indicators for particular sectors, which he describes as physical. It is difficult to see what Mr. Pentland means here, because no measure can properly be described as physical when it refers to the broad range of commodities included in, *e.g.*, "manufacturing," and the measures of "physical" output which Mr. Pentland uses in fact include two widely different concepts. His output measures for manufacturing and mining relate to flows of net value added, and corre-

[1] Incidentally his statement of my argument is to some extent misleading, particularly because of his use of my output per man and not of my output per man hour figures. Cf. Pentland, *op. cit.*, pp. 399 and 402, footnote 2. He also exaggerates the discrepancies between his findings and mine.

[2] Cf. *Revised Index of Industrial Production 1935–1951*, D. B. S., Ottawa, 1952, p. 28. This index became available after my original article was written.

spond closely to the concept of the industrial contribution to G.N.P.[1] These measures are extremely useful and are roughly comparable with the output concept which I used. However, the index used by Mr. Pentland to measure agricultural output is quite different, although he treats it as though it were homogeneous with those for the other two sectors. It is an index of the volume of farm output of the usual type, *i.e.*, the physical output of commodities sold off the farm (excluding inter-farm transfers), and consumed in farm homes, weighted by market prices. In fact, such an output index grossly overstates the technical progress which has taken place in agriculture, because in the period considered the input–output relations of agriculture with the rest of the economy have changed considerably.[2] Increased inputs of fertilisers and petroleum, etc., from other sectors have greatly contributed to the increased gross output of agriculture as measured by Mr. Pentland. If one is interested in the relative rate of progress in different sectors, and in the contributions of different sectors to overall growth, then a primary aim must be to avoid such double counting. It is paradoxical that Mr. Pentland, who seems to cherish an inverse brand of physiocratism in that he regards increases of productivity in agriculture as in some way less encouraging than similar changes in industry, should choose an indicator for agriculture which exaggerates its performance relative to industry, something he accuses me of doing—with no justification.

Apart from the incompatibility of the production concept which Mr. Pentland uses for agriculture with those for his other sectors, his employment data for agriculture are subject to much greater proportionate risk of error than those which I used for the economy as a whole, because for several of the years he covers they are based on straight-line interpolation of the decennial population census,[3] and they are subject to greater relative

[1] They are derived from the new official Canadian index of production referred to in the previous footnote. This is the only official industrial production index, apart from that of Ireland, in which not only the weights but also the indicators for individual industries are made up of net output indicators. For individual industries, the index is of the form:

$$\frac{\Sigma Q_1 P_0 - \Sigma q_1 p_0}{\Sigma Q_0 P_0 - \Sigma q_0 p_0}$$

where QP refers to the gross value of output, and qp refers to the value of materials, electricity and fuel inputs.

[2] A study of output and labour productivity in U.S. agriculture by J. W. Kendrick and C. E. Jones, *Survey of Current Business*, September 1951, shows that U.S. farm output measured in terms of its contribution to G.N.P. (roughly the same concept as that used by Mr. Pentland for Canadian manufacturing) rose about 20% between 1910–14 and 1945–49, whereas the volume of farm output at market prices (roughly the same concept which Mr. Pentland uses for Canadian agriculture) rose 60% in the same period, *i.e.*, by three times as much. The reason for this discrepancy is that American agriculture greatly increased its dependence on other sectors of the economy in this period, so that the ratio of intermediate products consumed to total farm output rose from less than a quarter before the First World War to just under a half after the Second World War. I do not suggest that the same relation between these two concepts of output would also hold in Canada, but it seems likely that the discrepancy would be large and in the same direction. Incidentally, it seems preferable for productivity purposes to take a moving average of farm output to eliminate some of the large year-to-year variations which are due to the weather.

[3] My employment figures were based on the bench-mark data of the census, which do not relate to ideal years from the viewpoint of productivity studies, but which are less likely to produce what Mr. Pentland calls "fortuitous" results than the results of interpolations.

conceptual difficulties in assessing the degree of activity of farmers' wives and children, or in deciding whether certain people are working at all.

Obviously the analysis of economic growth can be improved by productivity indicators for particular sectors, and I think that Mr. Pentland's estimates for mining and manufacturing are valuable complements to the overall measure. However, his discussion of the relative merits of these measures and of the overall measure is confusing and misleading, and his confidence in his indicator for agriculture is completely misplaced. Finally, it should be noted that the global productivity concept which I used is a good starting point for measuring economic progress because it reflects better the welfare impact of technological change than do indicators for particular producing sectors taken in isolation; as a total it can be cross-checked in several ways and, although its significance as an aggregate is still open to dispute, it has been subject to widespread discussion in recent years by welfare economists and others, so that its economic meaning is often clearer than measures for lesser aggregates of the type Mr. Pentland calls physical.

II

Mr. Lerdau claims to have followed my " method " in his study of productivity in New Zealand, with " one important difference." The difference is that he eliminates the real-income effect of changes in the terms of trade, whereas I did not. The reason I ignored this problem is that the terms of trade had no significant influence in the period with which I was dealing. Between 1931 and 1941 the Canadian terms of trade were unchanged, and over the period 1931–49 the small improvement in the terms of trade probably raised real income by under 2%, whilst real G.N.P. more than doubled. In New Zealand foreign trade is more important than in Canada, and there has been much greater instability in the terms of trade.

It therefore seems quite appropriate that Mr. Lerdau should use a different technique in dealing with the New Zealand economy than that which I used for Canada, and he is mistaken to suggest that I would disagree with his method in this respect, although I would not attempt to make a study of year-to-year movements in a period which includes the aftermath of devaluation and the Korean wool boom.

However, Mr. Lerdau is much more mistaken in thinking that the other elements of his " method " bear any resemblance to mine. It is in fact very doubtful whether his estimates can properly be described as measuring productivity at all because of the nature of his data on employment and working hours. His figure for the civilian labour force does not seem to have been adjusted for changes in unemployment,[1] and his series for hours worked refer to hours prescribed by the Arbitration Court and not to actual working hours. As Mr. Lerdau's estimates cover the war years, in which unemployment declined, and working hours greatly exceeded those prescribed by the

[1] Lerdau, in line (3) of his Table 1, *op. cit.*, refers to real output per civilian *active*, but in fact this line is simply the quotient of the first line (real output) divided by the second (civilian labour force). This is partly disguised by what must be a misprint in his 1947 figure for G.N.O.

Arbitration Court,[1] his estimate probably grossly overstates the war-time increase in output per man-hour.

Having produced a figure for overall productivity of such doubtful meaning, Mr. Lerdau then takes an estimate of productivity in agriculture by Mr. Bray, which is essentially an index of physical productivity with labour weights, and derives a measure for productivity in the rest of the economy by a process of residualism. Mr. Lerdau's arithmetic becomes peculiar at this stage. Mr. Bray's figures show a rise of 25% in agricultural productivity between 1936 and 1941, and a 35% increase between 1936 and 1945. Mr. Lerdau takes the figure of 25% and assumes it to be valid for the period 1938–43. For some peculiar reason, however, Mr. Lerdau says he is using Mr. Bray's figure for the period 1936–45.[2]

Even if there had been no conceptual incompatibility between Mr. Bray's figure for agriculture and Lerdau's estimate of overall productivity, and ignoring the confusion over the time periods, the technique used by Lerdau for deriving productivity in the non-agricultural part of the economy would render this latter calculation of doubtful value.

His partition formula ignores the problem of structural shifts entirely. In fact, he does not indicate the year to which his employment figures refer, and it is not possible to deduce this, as his figure for total employment does not correspond with the data for any of the years shown in his Table I, and his figure for agricultural employment corresponds with none of the figures given by Mr. Bray. No wonder he finds his results hardly credible!

After these curious manœuvres Mr. Lerdau ends up with a residual figure of 9·7% per annum increase in productivity in the non-agricultural sector and finds " verification " for this high figure in an estimate of Colin Clark. His logic here is extremely obscure. He accepts Colin Clark's figure of 1·3% per annum as a likely rate of growth of productivity in " tertiary industries." The high rate of increase of the non-agricultural sector must, therefore, be explained by that part of it which is not tertiary, *i.e.*, by manufacturing. Manufacturing in New Zealand was responsible for just over a quarter of non-agricultural employment, " tertiary industries " for most of the rest; therefore, if the whole of the non-agricultural sector grew at 9·7% per annum and the tertiary sector grew at 1·3%, then by applying Lerdau's own partition formula, productivity in manufacturing must have rocketed upwards at about 40% per annum—a figure quite different from that of Colin Clark!

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[1] Cf. *New Zealand Official Yearbook 1953*, p. 816, which gives a frequency distribution showing actual working hours in 1945 as derived from a special questionnaire in the census. The mean figure for actual weekly working hours was about forty-seven in a year in which the official series which Mr. Lerdau uses show a prescribed working week of about forty-one hours. It therefore seems highly likely that actual working hours were also higher than the legally prescribed hours in 1943.

[2] Lerdau's text only becomes intelligible if 1941 is substituted for 1945, 225 for 245, 1936 = 100 for 1938 = 100 in his table on p. 186; and if 1941 is substituted for 1945 on p. 187. Cf. F. R. Bray, " Employment, Productivity and Incomes in New Zealand Farming," *International Labour Review*, May 1950, p. 471.

STERLING BALANCES AND THE COLONIAL MONETARY SYSTEMS

THIS note is written within the context of the series of notes on colonial money and sterling balances published in this JOURNAL over the past four years.[1] My purpose is three-fold: to answer several points arising from Mr. Niculescu's note, to state and evaluate some neglected but relevant facts and to suggest a more fruitful approach.

The sterling balances in the possession of the colonial currency boards are, in part, sterling capital assets of the colonies involved, and as such contribute to any colonial net foreign investment. It is one of the principles of British colonial monetary systems that currency-fund assets should be invested in sterling securities; it has happened in fact that a major part of these investments is in United Kingdom Government securities, but this particular sterling investment is not a necessary consequence of the monetary systems, and is actually the manifestation of a balanced investment portfolio. Large sterling balances do not in themselves, then, indicate a loan to the British Government as Mr. Niculescu maintains.

Colonial monetary systems require a 100% backing, but, as the following facts indicate, the nature of the reserve system is neither simple nor uniform. The currency board of the Straits Settlements had large holdings of Straits Settlements securities until 1936, and the Malayan Currency Board held Malayan securities until 1949; Rhodesia is another exception to the general rule that currency boards are not allowed to hold the securities of their own governments. The present Malayan Currency Board possesses a house in Penang as a fixed asset; the Hong Kong Exchange Fund can, but does not, hold Hong Kong dollar assets and foreign exchange; and the Hong Kong currency funds hold local assets. It is the present working rule of the Crown Agents, who act for colonial governments and on their instructions, that at least 70% of colonial government sterling assets, including those of each currency fund, should be invested in the securities of the United Kingdom Government, leaving up to 30% to be invested in the securities of colonial and other Commonwealth governments. Thus at the end of 1953 the Malayan Currency Board held 20% of its assets in colonial and other Commonwealth sterling securities. Potentially, 30% of colonial sterling balances may become mutually available to other colonies for payment of imports.

To put the currency-reserve problem in its proper perspective, it should be recalled that currency is only part—and in economically developed colonies, a minor part—of the money supply. An increase, for example, in the money supply of a colony may be effected by a mail transfer from abroad through the facilities of a bank or by a loan made locally by a bank.

[1] The three most recent notes in the series are: "Sterling Balances and the Colonial Currency System: A Comment," Ida Greaves, ECONOMIC JOURNAL, December 1953, pp. 921–3; "Sterling Balances and the Colonial Currency System: A Reply," A. Hazlewood, *ibid.*, September 1954, pp. 616–17; and "Sterling Balances and the Colonial Currency System: A Comment," B. M. Niculescu, *ibid.*, pp. 618–19.

A proportion of any increase will eventually be required in legal tender, and it is against this proportion that the banks must surrender sterling to the Commissioners of Currency. This transaction does not affect the magnitude of the sterling balances of the colony. The currency notes are issued by an agency of the Colony and not by the United Kingdom Government, which neither issues the notes nor uses the surrendered sterling, unless and until the Crown Agents, acting for the Colony's currency fund, buy British Government securities on the market as part of an investment policy.[1] The purchase of currency with assets of equivalent value is normal to most monetary systems, and evidence that such a procedure places no unusual hardship on the colonial bank involved might be found in the fact that although two of the three note-issuing banks are allowed a pure fiduciary issue totalling $12 million Hong Kong currency in that colony, they have not availed themselves of this privilege—which is, after all, an anachronism.

It is true, however, that a proportion of the sterling balances of the currency funds cannot be used for current imports by the colonial governments. It is also true that some proportion of these currency-fund assets might be so utilised without necessarily endangering the nature of the colonies' monetary relations with London. With this there seems to be little disagreement, although students of the problem have their own concepts as to what that proportion might be.[2]

It is wrong, in my opinion, to move directly from this general theoretical finding to a specific policy statement—that the 100% reserve system is working undue hardship on the colonies by delaying or potentially delaying development and should, therefore, be abolished. This statement is difficult to substantiate in a series of notes, and tends to be misleading. In British East Asia, at least, no government project has as yet suffered from inability to use currency-fund sterling assets. Nor is it incongruous that an area which borrows funds for one purpose—development—should lend for another—to establish currency reserves, providing both the borrowing and the lending can be justified as appropriate to their specific purpose.[3]

While there has been no need to use the currency-fund assets, the time may come when British territories in East Asia require sterling—in addition to what is then in their possession and at their legal disposal—to finance

[1] *Cf.* Niculescu, *op. cit.* Here Mr. Niculescu makes a fundamental error, for in no sense can it be said that the United Kingdom Government " issues " currency in colonies where the currency-board system exists. Mr. Niculescu's plea for " locally established " issuing institutions is hardly a plea for something new. They have existed for at least fifty years.

[2] Dr. Greaves, for example, states that a minimum of two-thirds sterling reserves is required to meet all possible eventualities (Ida Greaves, " The Colonial Sterling Balances," *Essays in International Finance*, September 1954, p. 14). Other estimates include the 50% for all future issues in Jamaica (A. Hazlewood, " The Economics of Colonial Monetary Arrangements," *Social and Economic Studies*, Vol. III (December 1954), pp. 291–315) and a cautious 50% under certain well-considered conditions for the British African colonies (W. T. Newlyn and D. C. Rowan, *Money and Banking in British Colonial Africa*, Oxford: at the Clarendon Press, 1954, pp. 259–61).

[3] For the contrary opinion, stated without argument as a self-evident proposition, see A. Hazlewood, " The Economics of Colonial Monetary Arrangements," *loc. cit.*, and his " Colonial External Finance since the War," *The Review of Economic Studies*, December 1953, p. 49 (also appearing as No. 8 in the Oxford University Institute of Colonial Studies reprint series).

current imports. When such demand for sterling arises, a colony can borrow, as it does now, in London. While there is no *a priori* reason why a currency fund should not be allowed to purchase its own securities on the London market when marketability is assured, under the present 70% working rule there might be no net gain thereby. Local securities have been floated successfully in some colonies, but since they purposely deny themselves the advantages of the London market, their issue is limited to the anticipated capacity of colonial banks, insurance companies and public to purchase them with existing local funds.

The colonies have always been able to float their securities on the London market, and it is doubtful if the time will come when reasonable quantities of such securities will be unsaleable, providing there are the safeguards which usually attend a sound government borrowing programme and development plan. The ability of the government of an undeveloped area to buy its own securities is useful only if no one else will buy them, and it is not an essential for future development that currency-fund assets be utilised if other considerations should urge against it.

No evidence has been submitted in this series of notes which warrants the conclusion that the 100% sterling reserve system should be modified. There may be cases where such modification is appropriate, but any proposal for modification should be preceded by detailed research not only into the bare essentials of the monetary system but also into the characteristics of the entire economy for which the proposal is made.[1] For in each colony different weight must be given such factors as the increasing use of bank money, the primitive psychological factor, the temptation to use currency funds for ill-conceived development plans which have temporary political appeal and the effect of such development financing on the balance of payments. As an example of a special case, Malaya has recently converted its currency-fund holdings into longer-term securities at a capital loss, and this board at least might hesitate to urge a change in the 100% reserve system.

The objections which have been raised to colonial sterling balances in general and currency-fund sterling assets in particular are not really valid criticisms of the principles of the system. As Mr. Hazlewood himself writes, " It is not the existence of sterling balances, which play a necessary part in the economies of colonial territories, but their magnitude and their continuous increase which merit comment." [2] More valuable than critical, but necessarily incomplete, notes on the colonial monetary systems would be a detailed analysis of colonial development programmes and public-finance policies.

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[1] *E.g.*, Newlyn and Rowan, *op. cit.*

[2] " Memorandum on the Sterling Assets of the British Colonies: A Comment," A. Hazlewood, *The Review of Economic Studies*, Vol. XXII (1), No. 57, 1954–55.

CURRENT TOPICS

THE Council of the Royal Economic Society has appointed Mr. A. Fuller to the office of Assistant Secretary, vacant through the death of Mr. S. J. Buttress. Mr. Fuller has been, and remains, Chief Clerk of St. Catharine's College, Cambridge. In future all correspondence intended for the Assistant Secretary should be directed to the Marshall Library, Downing Street, Cambridge.

WE record with regret the sudden death in Washington of Professor H. A. Shannon. Professor Shannon, who had recently been appointed to the Chair of Economics at Makerere College, Uganda, but had not yet taken up his appointment, had served in recent years on the staff of the International Monetary Fund. He was earlier on the staff of the University of Bristol and of the London School of Economics. We offer our sincerest sympathy to his wife and family.

VISITORS to the United Kingdom during the present academic year include at Cambridge Professor W. T. Easterbrook as Pitt Professor, Professor G. C. Homans as Professor of Social Theory and Professor R. H. Strotz, who is working at the Department of Applied Economics. At Nuffield College, Oxford, is Professor A. Smithies. At the London School of Economics are Professor P. W. Buck, Professor C. Kaysen, Professor L. Lipson and Professor H. Somers.

SIR DENNIS ROBERTSON writes:

> "The obvious printer's error [actually, "editor's".—R.F.H.] in the penultimate line of my note on p. 410 of the September JOURNAL gives me an opportunity to ask the reader to substitute '. . . he will get more fun (of one kind or another) out of the $(m + n)^{th}$ £ of income than he is getting now out of the m^{th} £' for the final words of the note."

Houblon-Norman Awards. The Trustees of the Houblon-Norman Fund invite applications for Fellowships or Grants in aid of Research into the working of industry and finance in Great Britain and elsewhere and the economic conditions affecting them. Fellowships, which are intended for experienced research workers, are awarded for full-time research for one year, which may be renewed for a second year. Grants are awarded for either full-time or part-time work. The amount of the awards, which will take affect from October 1, 1956, will depend upon the circumstances of the candidate and the probable expenses of his work. Candidates must be

British subjects normally resident in the United Kingdom. Forms of application, which may be obtained from the Secretary of the Fund, c/o the Bank of England, London, E.C.2, should be returned not later than March 1.

The Trustees, on the recommendation of their Advisory Committee, have made the following awards for 1955/56:

Research Grants

Mr. G. Clayton, Lecturer, University of Liverpool. (Renewal).	The Present Organisation and Structure of the Swedish Banking System.
Mr. Ralph Davis, Lecturer, University of Hull.	The Organisation and Finance of the English Shipping Industry, 1660–1702.
Mrs. C. R. Fulop, Lecturer.	The Economics of the Buying Practices of Retailers.
Mr. E. L. Furness, Lecturer, Glasgow Commercial College.	20th Century Development of Scottish Banking.
Mr. R. E. George, Statistical and Administrative Assistant, South Western Gas Board. (Renewal.)	Economic Policy in the Gas Industry before Nationalisation.
Miss D. M. Knox, History Mistress, Ursuline Convent, Brentwood. (Renewal.)	London Brewing Trade 1830–1914.
Mr. R. V. Lennard, Historian. (Renewal.)	Rural England in the Feudal Age.
Mr. G. J. de C. Mead, Bank of England.	The Intendants of 18th Century France.
Mr. A. L. Minkes, Tutor, Department of Extra-Mural Studies, University of Birmingham.	The Economic Structure and Problems of the British Paint and Varnish Industry.
Mr. R. G. Opie, Lecturer, London School of Economics.	Techniques of Central Banking Control in the Federal Republic of Germany.
Mr. R. A. C. Parker, Lecturer, University of Manchester.	18th and early 19th Century Landed Estates.
Mr. H. W. Parris, W. E. A. Tutor, Northamptonshire.	Board of Trade Railway Department and its influence on the Development of the Railway System in Great Britain.
Mr. R. J. Pounce, Research Officer, Board of Trade.	Post-war Unemployment in Great Britain.
Mr. C. N. Ward-Perkins, Fellow of Pembroke College, Oxford.	An Index of Country Banks in England and Wales.
Mr. A. A. Zukowski, formerly Scientific Assistant, Commonwealth Forestry Bureau, Oxford.	Forest Policy of England in relation to her Economic Development.

THE following have been admitted to life fellowship of the Society:

Anantakrishnan, R.	Misawa, Prof. T.	Sen, S. R.
Hallinan, T.	Naik, M. C.	Teng, Q. K.
Loasby, B. J.		

THE following have been admitted to fellowship of the Society:

Adeniyi, H. O.	Chen Chen, F.	Ghosh, S. T.
Adophy, C. J.	Chew, D.	Grunfeld, Y.
Agarwala, Dr. J. S.	Chonchol, J.	Guelfat, Dr. I.
Alan, Z.	Choudhury, T.	Gupta, S. C.
Antrobus, N. L.	Chukwuka, F. O.	Hakaspi, H.
Banerjee, H.	Coward, N. J.	Harris, C. T.
Basu, P. K.	Dalton, G.	Heflebower, Prof. R. B.
Bolshaw, P. H.	Dasgupta, D.	Heron, J. P.
Brooksbank, J.	Frantzen, H. C.	Hong, E. S.
Brown, W. M.	Gavrielides, H. D.	Iengar, M. V.
Chanserker, Prof. M. A.	Ghosh, A. C.	Jacques, R.

Jao, Y. C.
Kimura, Prof. M.
Kirthiratne, C.
Kwok, B. W.
Laxman, N. K.
Leakey, B. P.
Leyden, J. L.
Lieu, H-S.
Lin, T. C.
Ling, C. T.
Lloyd, J. E. N.
Lustig, S.
MacDonald, J. J. O.
Marshall, S. A.
Millar, R. N.
Mills, J. L.
Mittra, P. C.
Newbigging, E. L.
Nidditch, L.
Nzeribe, B. U.
Olowokere, J. A.
Page, F. V.
Pandit, S. B.
Pareek, A. K.
Pattabhiraman, N.
Primus, B. V.
Rodrigues, L. C.
Sabherwal, K. N.
Samuel, J.
Sircar, S.
Smith, L. C.
Squair, C. H.
Staub, P.
Swee, G. K.
Talbot, E. W.
Tame, K-F.
Tarkas, A. D.
Tayab, M. S.
Theocharis, R. D.
Thong, J. K. S.
Tymvios, N. J.
Uzoh, L.
Watkin, E. E.
White, S. N.
Yam, R. L. K.

THE following have been admitted to Library membership of the Society:

Banco de Guatemala, Departamento de Estudios Economicos.
City College, Evening Commerce Dept., Calcutta.
Instituto Universitario de Economia e Commercio, Venezia.
Ministry of Economic Affairs, Djakarta.
Seton Hall University, Patterson, N.J.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

VOL. 118, PART 2, 1955. *Net Investment in Fixed Assets in the United Kingdom, 1938–1953:* P. REDFERN. *The Teaching of Mathematical Statistics at University Level:* E. S. PEARSON. *Farm Wages in Central Scotland from 1814–1870:* G. HOUSTON. *Wholesale Prices in 1954. Statistics Available on the Local Government Services:* B. J. BROCKS.

Applied Statistics

VOL. IV, NO. 2, JUNE 1955. *Reservoirs of Infection of Pulmonary Tuberculosis in Warwickshire:* M. JESSOP. *Multiple Regression between Variables Measured at the Points of a Plane Sheet:* G. H. JOWETT. *Calculation by Accumulation:* P. A. DANIELL and F. D. K. LIDDELL. *A Simple Non-parametric Graphical Test for the Significance of a Difference:* W. Z. BILLEWICZ. *Multivariate Analysis:* J. WISHART.

Economica

VOL. XXII, NO. 87, AUGUST 1955. *Seven Centuries of Building Wages:* E. H. PHELPS BROWN and S. V. HOPKINS. *A System of National and Domestic Accounts:* G. STUVEL. *The I.C.F.C. Revisited:* B. TEW. *Statistical Calculations of Tax Burdens:* A. R. PREST. *The Delegation of Authority to Spend:* L. FOLDES.

The Review of Economic Studies

VOL. XXII, NO. 59, 1954–55. *On Recursiveness and Interdependency in Economic Models:* R. BENTZEL and B. HANSEN. *A Note on Dynamic Economics:* H. D. DICKINSON. *Farewell to the New Welfare Economics:* D. BRAYBROOKE. *On Choosing between Probability Distributions:* A. D. ROY. *Costs in Alternative Locations: the Radio Industry:* D. C. HAGUE and J. H. DUNNING. *A Note on Measuring the Share of the Public Sector:* R. MARRIS. *National Income Estimates in the Statistical Policy of an Underdeveloped Area: a Comment:* W. C. HOLLINGER. *Further Comment:* I. G. STEWART. *The Problem of Oligopoly: a Comment:* J. H. DAVIES.

Oxford Economic Papers

VOL. 7, NO. 2, JUNE 1955. *The Place of the Economist in Government:* SIR R. HALL. *Schumpeter's* History of Economic Analysis*:* G. B. RICHARDSON. *The Foundations of Revealed Preference Theory:* P. NEWMAN. *Concerning Marginal Utility:* W. E. ARMSTRONG. *The Terms of Trade and the National Income, 1950–52:* J. R. PARKINSON. *Multiple-company Mergers and the Theory of the Firm:* D. SCHWARTZMAN.

Journal of Industrial Economics

VOL. III, NO. 3, JULY 1955. *Industrial Productivity: the Lessons of Fawley:* E. M. HUGH-JONES. *Changing Patterns of Pit Performance:* W. H. SALES. *IRI: Its Origin and its Position in the Italian Industrial Economy:* P. SARACENO. *Structure and Performance in the Titanium Industry:* F. G. MASSON. *The U.K. Cotton Industry, 1937–54:* B. VITKOVITCH.

Transactions of the Manchester Statistical Society

SESSION 1954–55. *Some Problems in the Estimation of Personal Savings and Investment:* C. T. SAUNDERS. *The British Aircraft Industry:* SIR W. FARREN. *Retail Trade Statistics:* W. RUDOE. *Newspaper Circulations, 1800–1954:* A. P. WADSWORTH. *The Economic Effects of Company Taxation:* N. KALDOR.

The Manchester School of Economic and Social Studies

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Scottish Journal of Political Economy

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The Economic History Review

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The British Journal of Sociology

VOL. VI, NO. 2, JUNE 1955. *Conference of the British Sociological Association, 1955. Voting Behaviour and its Study in Britain:* D. BUTLER. *Voting Behaviour in France:* J. STOETZEL. *Power in British Parties:* R. T. MCKENZIE. *Pressure Groups in British Government:* W. J. M. MACKENZIE. *Public Opinion, Polls and Foreign Policy:* H. DURANT. *The Press and Public Opinion:* D. MCLACHLAN. *Public Opinion and Foreign Policy:* K. YOUNGER. *The Radical Right: a Problem for American Democracy:* S. M. LIPSET.

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The Sociological Review

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Population Studies

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Political Studies

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International Affairs

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Soviet Studies

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Accounting Research

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Journal of the Institute of Actuaries

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The Banker

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VOL. CV, NO. 357, OCTOBER 1955. *Sterling after Istanbul. The Great Bear or the Little?:* J. MARVIN. *The New Curve of Gilt-edged Yields. World Bank Leads the Way. Japan's Economic Problem:* M. NITANI. *Denmark under Strain:* G. SOLOVEYTCHIK. *Australia's Hire-purchase Boom:* D. C. ROWAN.

The Bankers' Magazine

VOL. CLXXX, NO. 1336, JULY 1955. *An American Banker's Look at the European Fund:* A. J. WARNER. *Paraphernalia for Development:* M. R. FISHER. *The Prescribed Securities. Insurance Accounts Analysed.*

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VOL. CLXXX, NO. 1339, OCTOBER 1955. *Bank Rate or Restriction of Credit?:* R. G. HAWTREY. *The Credit Squeeze in the Light of Basic Principles:* W. T. NEWLYN. *National Income and Expenditure. Loan Policy of Public Authorities in Western Germany:* G. SCHMÖLDERS.

Barclays Bank Review

VOL. XXX, NO. 3, AUGUST 1955. *Credit Control. Wages in a Competitive World. Report on East Africa. The Central Bankers' Bank.*

District Bank Review

NO. 115, SEPTEMBER 1955. *In Search of Industrial Peace:* T. E. CHESTER. *United States Manufacturing Subsidies and Britain's Trade Balance:* J. H. DUNNING.

Lloyds Bank Review

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NO. 38, OCTOBER 1955. *Notes on Public Finance:* L. C. ROBBINS. *The Case for Investment and Productivity:* E. DEVONS. *Automobiles: the Mass Market:* G. WANSBROUGH.

Midland Bank Review

AUGUST 1955. *The Provision of "Public Sector" Capital. The Transformation of International Lending. Business Conditions in Northern Ireland.*

National Provincial Bank Review

No. 31, AUGUST 1955. *Can Inflation be Stopped?:* SIR O. HOBSON. *Livestock Production in Great Britain:* J. E. NICHOLS.

The Three Banks Review

No. 27, SEPTEMBER 1955. *The Case for Variable Exchange Rates:* J. E. MEADE. *Does America Breed Depressions?:* F. W. FETTER. *The Goldsmith Banker.*

Westminster Bank Review

AUGUST 1955. *Industrial Production and Productivity in Japan:* G. C. ALLEN. *Causes and Significance of Recent Industrial Disputes:* J. H. RICHARDSON. *Land and Labour: Causes of the decline in the number of agricultural workers:* G. P. HIRSCH.

The Journal of the Institute of Transport

VOL. 26, NO. 5, JULY 1955. *Shipping and the International Organisations:* LORD RUNCIMAN. *Shipping in Port:* F. H. CAVE and F. H. DAWSON. *New Thinking in Transport:* G. WALKER. *Bianconi—Road Transport Pioneer:* J. MCKNIGHT.

VOL. 26, NO. 6, SEPTEMBER 1955. *Helicopter Transport:* N. E. ROWE. *Helicopters in International Scheduled Operations:* A. VERNIEUWE. *Britain's Part in the International Exchange of Railway Information:* C. E. R. SHERRINGTON. *Further Notes on Transport in Mauritius:* A. JESSOP.

The Agricultural History Review

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Planning

VOL. XXI, NO. 383, JULY 1955. *Industrial Trade Associations.*
VOL. XXI, NO. 384, AUGUST 1955. *Balance Sheet of the Press.*
VOL. XXI, NO. 385, SEPTEMBER 1955. *Better Industrial Design.*
VOL. XXI, NO. 386, OCTOBER 1955. *How Many Houses?*
VOL. XXI, NO. 387, OCTOBER 1955. *Graduates' Jobs.*

Town and Country Planning

VOL. XXIII, NO. 135, JULY 1955. *A New Sheffield:* G. HAYTHORNTHWAITE. *Planning in Australia:* R. A. GARDNER. *The Character of Cities: I: Manchester's Dilemma:* D. SENIOR. *Two Yugoslav Towns:* P. BRANKO. *Class and the Neighbourhood:* P. COLLISON.

VOL. XXIII, NO. 136, AUGUST 1955. *Urban Congestion and Green Belts. The Character of Cities: II: Hull Favours Flexibility:* D. DAVIS. *Kenya Houses its Africans:* D. MORIARTY. *A Brickworks Inquiry:* A. E. TELLING. *Kwinana New Town:* M. FEILMAN.

VOL. XXIII, NO. 137, SEPTEMBER 1955. *Implications of the Green Belt Policy. Housing Subsidies and Density in City Development. The Character of Cities: III: Cardiff's Assets and Needs:* T. A. LLOYD. *Salt and Subsidence:* S. H. BROWN. *Changes in the Village:* E. W. MARTIN.

VOL. XXIII, NO. 138, OCTOBER 1955. *First Principles of Planning. Is the Barlow Policy Failing?:* P. SELF. *The Character of Cities: IV—Norwich, a Provincial Capital:* N. TILLETT. *Canada Contemplates Dispersal:* G. S. HATTON and N. PEARSON. *Change in the Village: II:* E. W. MARTIN. *The Study of Planning Decisions:* P. COLLISON. *The Thames Oil Refineries:* B. CRACKNELL.

Cartel

VOL. 5, NO. 3, JULY 1955. *Ban these Practices!:* R. EVELY. *Hire Purchase—on What Terms?:* M. TAMPLIN. *Consumer Protection: a German View:* K. KUHNE.

Hard Fibres

No. 17, JUNE 1955. *World Situation. Hard Fibre Growing in Indonesia—Will it Survive?: Prospects for Sisal.*

No. 18, SEPTEMBER 1955. *Hard Fibre Imports. World Situation. Prospects for Sisal: 2: New Uses.*

The Canadian Journal of Economics and Political Science

VOL. 21, NO. 3, AUGUST 1955. *A "Constitutional Crisis" in British Columbia:* G. F. G. STANLEY. *The 1937–8 Recession in Canada:* E. J. CHAMBERS. *Empirical Studies of Demand:* W. C. HOOD. *Television as a Political Issue in Britain:* J. S. HARRIS. *A Curious Case of Neglect: Marshall's* Industry and Trade*:* H. H. LIEBHAFSKY. *Morals and Politics: the Current Debate:* C. B. JOYNT and S. H. HAYDEN.

The Economic Record

VOL. XXXI, NO. 60, MAY 1955. *Population Growth and Levels of Consumption in New Zealand:* H. BELSHAW. *Australia's Holdings of Gold and Foreign Exchange:* D. G. BADGER. *Aggregate Production Functions:* C. G. F. SIMKIN. *Planning and Compensation in Victoria:* F. G. DAVIDSON. *The Aggregate Supply of New Zealand Farm Products:* R. W. M. JOHNSON. *The Impact of Electricity:* E. A. BOEHM. *Merchants in Action: the Australian Tariffs of 1852:* J. A. LA NAUZE.

The Australian Quarterly

VOL. XXVII, NO. 2, JUNE 1955. *How Can Australia Balance her Trade?:* W. S. KELLY. *Some Economic Aspects of the Scientific Study of Industrial Relations:* D. W. OXNAM. *The Need for an Australian Institute of Applied Sociological Research:* A. SILBERMAN. *A Problem that Grows with the Years:* N. G. FRANCIS. *The Welfare State and its Consequences for Education:* C. D. HARDIE. *The Establishment and Development of Co-operatives in the N.S.W. Fishing Industry:* K. E. WALKER.

South African Journal of Economics

VOL. 23, NO. 2, JUNE 1955. *Economic Aspects of the Karakul Industry in South West Africa:* D. C. KROGH. *Hospitalisasie:* E. H. D. ARNDT. *The Sterling Area:* I. L. MULLER. *The Rise of the African Tobacco Industry in Nyasaland and its Production Problems:* W. E. HAVILAND. *Euler's Theorem and the Problem of Distribution:* R. L. THRELFELL.

Union of South Africa Finance and Trade Review

VOL. 1, NO. 7, JULY 1955. *Economic Aspects of the Creditworthiness of the Union:* J. A. LOMBARD. *The South African Budget, 1955–1956:* H. W. J. WIJNHOLDS. *Resources Development in South Africa:* F. J. DU TOIT.

The Indian Journal of Economics

VOL. XXXV, NO. 138, JANUARY 1955. *International Rivalry in the Textile Trade:* OM PRAKASH. *Some Aspects of Land Reforms under Changing Economy:* B. BIHARI. *Progress of Land Tenure System in Unpartitioned Bengal Since the Days of Permanent Settlement:* P. R. BHADURI. *Economics of Small Scale and Cottage Industries in India:* H. BOSE. *Measurement of Population Growth:* S. N. AGARWALA.

The Indian Economic Journal

VOL. III, NO. 1, JULY 1955. *The British Trade Union Movement: a Statistical Analysis:* A. MITRA. *Jute Production Policies of India and Pakistan:* F. C. SHORTER. *Indian Taxation Policy 1946–51 and Private Investment:* N. K. CHOUDHRY. *India's External Trade—Some Problems:* V. K. SASTRY. *Absenteeism in the Indian Cotton Mill Industry:* M. V. VENKATARAMAN.

The Indian Economic Review

VOL. II, NO. 3, FEBRUARY 1955. *The Problem of Financing of Economic Development:* M. KALECKI. *Some Problems of International Comparison of Public Social Expenditures:* N. T. WANG. *Operating Efficiency of Indian Railways, 1934–51:* AMBA PRASAD.

The National Bank of India Review

VOL. 1, NO. 4, JULY 1955. *South Asia Favours Bilateral Aid. The Overseas Trade Corporation:* F. BOWER. *Relative Decline in Asian Rice Production.*

VOL. 1, NO. 5, OCTOBER 1955. *New Chapter for Commodities Markets. The Quest for New Foreign Investment. A Smaller Slice of a Larger Cake. Commodities and other Market Trends.*

Tata Quarterly

VOL. X, NOS. 2–3, APRIL–JULY 1955. *Industrial Expansion in Recent Years. Economic and Financial Review, January–June 1955.*

Journal of the Statistical and Social Inquiry Society of Ireland

VOL. XX, 1953-54. *The Social Geography of Belfast:* E. JONES. *An Analysis of Irish Transport Acts:* B. F. SHIELDS. *Aspects of Public Expenditure in Northern Ireland:* P. ROBSON. *A Study of Factors Which Determine the Supply of Pigs:* R. O'CONNOR. *Ireland's Future in the World Demand on Energy Resources:* D. T. FLOOD. *Symposium on the World Economic Outlook for 1954:* C. F. CARTER and others. *Some Aspects of Production Costs in Irish Agriculture, as Illustrated by the Cost of Producing Sugar Beet:* M. J. COSTELLO. *Some Precursors of Bord na Mona:* C. S. ANDREWS. *The Northern Ireland Trade Union Movement:* D. W. BLEAKLEY. *Reflections on Comparing the Irish and English Companies Acts:* R. HEALY.

International Labour Review

VOL. LXXI, NO. 5, MAY 1955. *Can the Modern State Afford more Welfare?:* K. G. WOLD. *Social Security and the Medical Profession:* J. MAYSTRE. *Freedom of Association and Industrial Relations in Asian Countries: II:* E. DAYA.

VOL. LXXI, NO. 6, JUNE 1955. *The Modern Approach to Industrial Welfare:* P. CHU. *The Decline in Wage Differentials Based on Skill in the United States:* E. E. MUNTZ. *The Influence of International Labour Conventions on Greek Legislation:* N. VALTICOS.

VOL. LXXII, NO. 1, JULY 1955. *Atomic Energy and Social Policy. The Contribution of Life Insurance to Social Security in the United States:* C. C. NASH. *Social Problems in Switzerland:* G. PASSE.

VOL. LXXII, NOS. 2–3, AUGUST–SEPTEMBER 1955. *The Productivity of African Labour:* P. DE BRIEY. *Refugee Seamen:* G. J. VAN HEUVEN GOEDHART. *Social Problems of the Belgian Middle Classes:* O. BOSSAERT. *General Education and Vocational Training in Great Britain:* G. D. H. COLE.

VOL. LXXII, NO. 4, OCTOBER 1955. *The Thirty-eighth Session of the International Labour Conference, Geneva, June 1955. Handicrafts in Europe:* M. LALOIRE. *Pensionable Age under Old-age Pension Schemes:* D. S. GERIG.

International Financial Statistics

VOL. VIII, NO. 7, JULY 1955. *New Tables and Notes for Colombia and El Salvador.*

VOL. VIII, NO. 8, AUGUST 1955. *New Tables and Notes for Costa Rica, India and Ireland.*

VOL. VIII, NO. 9, SEPTEMBER 1955. *New Tables and Notes for Turkey.*

VOL. VIII, NO. 10, OCTOBER 1955. *New Tables and Notes for Guatamala, Mexico and Panama.*

Economic Bulletin for Europe

VOL. 7, NO. 2, AUGUST 1955. *Current Economic Developments in Europe. Recent Developments in Trade between Eastern and Western Europe. The Economy of Hungary, 1950 to 1954.*

Productivity Measurement Review

NO. 1, MAY 1955. (This is the first issue of a new review, to be published quarterly by the European Factors Division of the European Productivity Agency. Copies may be obtained from the O.E.E.C. Sales and Distribution Section, 2 rue André Pascal, Paris 16e, or from national Sales Agents.) *Input–Output Analysis as a Basis for Productivity Measurement:* K. BORCH. *Factory Productivity Studies in the United States. Case Study Data on Productivity and Factory Performance.*

NO. 2, AUGUST 1955. *Why Measure Productivity? Methods of Productivity Measurement in the Nationalised Basic Industries in Austria:* R. GRÜNWALD. *Productivity Measurement in the Belgian Shoe Industry:* P. FELDHEIM. *Work of the French Productivity Measurement Centre in the Flour-milling Industry:* J. CARRIE. *The Proper Formula to Employ in Calculating Productivity:* L. A. MAVERICK.

Econometrica

VOL. 23, NO. 3, JULY 1955. *Equality of Factor Prices in World Trade:* L. W. MCKENZIE. *An Econometric Study of Supply and Demand for New Zealand's Exports:* A. R. BERGSTROM. *Income Distributions: a New Model:* R. S. G. RUTHERFORD. *Sur l'importance en économétrie de la distinction entre les probabilités rationnelles et irrationelles:* M. FRECHET. *A Model for Optimizing Production by Reference to Cost Surrogates:* A. CHARNES, W. W. COOPER and B. MELLON.

Revue de l'Institut International de Statistique

VOL. 22, NOS. 1–3, 1954. *The Grouping of Observations in Regression Analysis:* S. J. PRAIS and J. AITCHISON. *Errors in Variables:* J. DURBIN. *Recherche d'une Fonction de Coût applicable aux Enquêtes par Sondage de l'Institut National de la Statistique et des Études Économiques:* P. THIONET. *The ASN Concept in Attributes Double Sampling Plans:* A. ABRUZZI. *Comparability of Statistics of Capital Formation:* J. B. D. DERKSEN. *A Survey of the Living Conditions of Arab Families in Tripolitania in November–December 1950:* J. L. NICHOLSON. *The Social Survey of Port Louis (Mauritius):* L. SILBERMAN.

Public Finance

VOL. X, NO. 2, 1955. *Some Aspects of Debt Managements in the United States:* B. U. RATCHFORD. *The Direct–Indirect Tax Problem: Fifteen Years of Controversy:* D. WALKER. *Methode d'Analyse des Consequences Économiques de la Fiscalité et Regles particulières aux Territoires sous-développés:* GUÉZÉ. *The Funds System of the State of New Mexico:* F. F. BLACHLY and M. E. OATMAN. *Income Tax Progression in Britain:* M. KUBO.

Kyklos

VOL. VIII, NO. 1, 1955. *Vor einer neuen Etappe der industriellen Revolution:* E. SALIN. *The Relevance of the Competitive, Laisser-faire Economic Model to Modern Capitalistic National Economies:* C. B. HOOVER. *Luigi Einaudi's* Saggi*:* G. DEMARIA. *Die klassischen Grundlagen der Sozialorganisation der Inder:* L. VON WIESE. *À propos d'un manuel d'économie internationale:* J. WEILLER.

VOL. VIII, NO. 2, 1955. *An Application of Population Analysis to the Automobile Population of the United States:* K. E. BOULDING. *An Activity Analysis Approach to Location Theory:* M. BECKMANN and T. MARSCHAK. *Ferdinand Tönnies, Sociologist—a Centennial Tribute:* E. G. JACOBY. *Röpkes Internationale Ordnung:* A. AMONN. *Soziale Determinismen und menschliche Freiheit:* L. v. WIESE. *Pluralism in the Older English Universities:* M. F. LLOYD PRICHARD.

The American Economic Review

VOL. LXV, NO. 3, JUNE 1955. *The Analysis of Devaluation:* F. MACHLUP. *The Theory of Flexible Exchange Rates:* E. V. MORGAN. *Obsolescence and Technological Change:* M. FRANKEL. *Theory of Treasury Debt Management:* J. COHEN. *General Equilibrium Analysis of Excise Taxes:* P. WELLS.

VOL. XLV, NO. 4, SEPTEMBER 1955. *Financial Aspects of Economic Development:* J. G. GURLEY and E. S. SHAW. *Factor Proportions in Underdeveloped Areas:* R. S. ECKAUS. *Cotton Mechanization and Economic Development:* J. H. STREET. *Spatial Equilibrium: Livestock-feed Economy:* K. A. FOX and R. C. TAEUBER. *Soviet Price Reductions for Consumer Goods:* C. D. CAMPBELL and R. G. CAMPBELL.

The Annals of the American Academy of Political and Social Science

VOL. 300, JULY 1955. *Internal Security and Civil Rights.*

VOL. 301, SEPTEMBER 1955. *Higher Education under Stress.*

The Quarterly Journal of Economics

VOL. LXIX, NO. 3, AUGUST 1955. *Recent Open Market Committee Policy and Technique:* D. CARSON. *Investment Criteria, Productivity, and Economic Development:* W. GALENSON and H. LEIBENSTEIN. *Differential Rates of Productivity Growth and International Imbalance:* J. M. LETICHE. *The Concept of Economic Sectors:* M. WOLFE. *Federal Credit Agencies and the Structure of Money Markets, Interest Rates and the Availability of Capital:* R. FREEDMAN.

The Journal of Political Economy

VOL. LXIII, No. 3, JUNE 1955. *Economic Development, Income Distribution, and Capital Formation in Mexico:* A. STURMTHAL. *An Asset Influence in the Labor Market:* L. HOUGH. *Sterling's Recurring Post-war Payments Crises:* S. I. KATZ. *Recent Developments in Cost Accounting and the "Marginal Analysis":* J. S. EARLEY. *Location Theory and Regional Economic Growth:* D. C. NORTH. *Alfred Marshall and Tariff Reform, 1903; Some Unpublished Letters:* H. W. MCCREADY.

VOL. LXIII, No. 4, AUGUST 1955. *The Economic Gains of European Integration:* F. GEHRELS and B. F. JOHNSTON. *Labor Discipline, Trade-unions, and the State in India:* M. D. MORRIS. *Cardinal Welfare, Individualistic Ethics, and Interpersonal Comparisons of Utility:* J. C. HARSANYI. *Growth Models and Underdeveloped Economies:* H. J. BRUTON. *Effects of Value-of-Service Pricing upon Motor Common Carriers:* G. W. WILSON. *Economists and the Enlightenment in Spain, 1750–1800:* R. S. SMITH.

The Review of Economics and Statistics

VOL. XXXVII, No. 3, AUGUST 1955. *Acceleration and Related Theories of Investment: an Empirical Inquiry:* J. MEYER and E. KUH. *Direct Effects of a United States Recession on Imports: Expectations and Events:* H. K. ZASSENHAUS. *On the Stability of Consumer Expectations:* R. FERBER. *How Induced is Induced Investment?:* H. BREMS. *Index of Seasonal Variation in Unemployment:* W. L. HANSEN. *Accelerated Amortization and Industrial Concentration:* R. T. SELDEN.

Industrial and Labor Relations Review

VOL. 8, No. 4, JULY 1955. *Codetermination in German Industry: Origins of Codetermination:* E. F. BEAL; *Codetermination in Practice:* W. H. MCPHERSON. *Secondary Labor Force Mobility in Four Midwestern Shoe Towns:* R. C. WILCOCK and I. SOBEL. *Collective Bargaining in the Pacific Coast Fisheries: The Economic Issues:* J. A. CRUTCHFIELD. *Patterns of Union Membership in the Retail Trades:* M. S. ESTEY. *The Guaranteed Annual Wage, Employment and Economic Progress:* W. A. LEEMAN. *Supervision in the British West Indies: Source of Labour Unrest:* W. H. KNOWLES.

VOL. 9, No. 1, OCTOBER 1955. *Interunion Disputes in Great Britain and the United States:* H. G. GAMSER. *Local Union Structure: Formality and Reality:* H. J. LAHNE and J. KOVNER. *A New Technique in Seniority Administration:* R. P. BROWN. *The Strategic Alliance as a Factor in Union Growth:* M. S. ESTEY. *Labor Market Behaviour in Small Towns:* I. SOBEL and R. C. WILCOCK. *Effects of "Right-to-Work" Laws: a Study of the Texas Act:* F. MEYERS. *Labor Arbitration: a Current Appraisal:* H. W. DAVEY. *A Pattern for the Study of Human Relations in Industry:* S. BARKIN. *Union Participation in Foreign Aid Programmes:* D. HEAPS. *An Italian's View of American Labor:* O. ORNATI.

The Southern Economic Journal

VOL. XXII, No. 1, 1955. *The Problem of Verification in Economics:* F. MACHLUP. *The Per Se Doctrine and the New Rule of Reason:* J. W. MARKHAM. *State Per Capita Income Differentials; 1940 and 1950:* J. L. FULMER. *A Reappraisal of F.O.B. Pricing and Freight Absorption:* D. DEWEY. *The New Threat of Synthetic to Natural Rubber:* R. SOLO. *A Period Analysis of Fiscal Policies:* W. R. ALLEN and W. OI. *Union Shop Authorization Referendum:* M. BERKOWITZ. *Changing N.L.R.B. Policies: 1953–54:* F. WITNEY.

The Journal of Economic History

VOL. XV, No. 2, 1955. *The Trade Crisis of the Early 1620's and English Economic Thought:* J. D. GOULD. *The History of Guaranteed Wages and Employment:* D. A. SEASTONE. *The Farmers' Attitude Towards British Investment in American Industry:* R. V. CLEMENTS.

Harvard Business Review

VOL. 33, No. 4, JULY–AUGUST 1955. *Business and the Good Society:* R. DEMOS. *It's Time to Research the Consumer:* P. MARTINEAU. *Managers in Transition:* V. J. KALLEJIAN, I. R. WESCHLER and R. TANNENBAUM. *Decentralization and Intracompany Pricing:* J. DEAN. *Who's Who in Personnel Administration:* R. SALTONSTALL. *Key Questions in Pension Fund Investment:* W. D. GRADISON. *The Strategy of Product Policy:* C. H. KLINE. *How to Evaluate Automation:* J. R. BRIGHT. *A Business Look at Government Spending:* S. B. COLGATE. *Stimulate your Executives to Think Creatively:* F. D. RANDALL.

Foreign Affairs

VOL. 33, NO. 4, JULY 1955. *The Bad and the Good in Us:* P. H. DOUGLAS. *The Mind of Asia:* M. R. MASANI. *The Future of Our Professional Diplomacy:* G. F. KENNAN. *The Soviet Navy:* H. W. BALDWIN. *Thermo-nuclear Reactions: Can They be Used for Man's Benefit?:* J. S. WALKER. *Reflections on the Yalta Papers:* R. J. SONTAG. *Slavery, Monarchy and Modern Brazil:* G. FREYRE. *A Fresh Look at the Inter-American Community:* E. G. MILLER. *Rearmament and the German Economy:* H. J. DERNBURG. *Ottawa and Washington Look at the U.N.:* K. MCNAUGHT. *How Unified is the Commonwealth?:* G. F. HUDSON.

Land Economics

VOL. XXXI, NO. 2, MAY 1955. *How will Atomic Power Affect the Electric Power Industry?:* E. W. MOREHOUSE and T. BAUMEISTER. *Economics and the Public Interest:* I. G. HINES. *Some Fundamentals of Mineral Economics:* O. C. HERFINDAHL. *Is the Theory of the Firm Misused in Current Land Economics Research?:* C. C. MITCHELL. *Institutions, Ground Water and Overdraft—an Aspect of Irrigated Agriculture:* J. H. SNYDER. *Mechanics of the Urban Economic Base: Causes and Effects of Change in the Base Ratios and Ratio Elements:* I. R. B. ANDREWS. *The Accumulation of Wealth in the Form of Land Ownership in Underdeveloped Areas:* R. SOLO.

VOL. XXXI, NO. 3, AUGUST 1955. *Economic Development of Underdeveloped Areas: Past and Present:* B. HIGGINS. *Land-to-Tiller Policy in Formosa:* H-S. TANG and J-L. CHEN. *National Forest Contributions to Local Governments:* E. T. WILLIAMS. *Measurement of the Economic Base of the Metropolitan Area:* J. M. MATTILA and W. R. THOMPSON. *A Reconsideration of the Cost of Capital and Reasonable Rate of Return:* F. P. MORRISSEY. *Housing Data by the Sampling of Public Records:* S. J. MAISEL.

Journal of Farm Economics

VOL. XXXVII, NO. 3, AUGUST 1955. *Changes in the Structure of Demand for Farm Products:* K. A. FOX. *A Statistical Analysis of Factors that Affect Prices of Coffee:* H. HOPP and R. J. FOOTE. *Agricultural Interest in the Regulation of Truck Transportation:* G. BLACK. *The Elasticity of Demand for Florida Produce:* E. LIMMER. *Livestock and Grain Market Reports —They Can be Improved:* F. B. MCCORMICK. *A Method of Farm Real Estate Valuation for Tax Assessment:* H. W. OTTOSON, A. R. AANDAHL and L. B. KRISTJANSON. *Alternative Methods of Figuring Depreciation under the Internal Revenue Code of 1954:* R. R. BOTTS and T. F. HAYGOOD. *An Extension Philosophy for Farm and Home Development Work:* P. DORNER. *Trends in Number of Farms Classified by Size:* J. C. ELLICKSON. *Classification of the Agriculture Population in the United States:* L. J. DUCOFF.

Economic Geography

VOL. 31, NO. 3, JULY 1955. *A Service Classification of American Cities:* H. J. NELSON. *Iron Ore Production at Kirkenes, Norway:* T. LLOYD. *Changing Patterns of Coal Production in the Eastern Interior Field:* H. G. ROEPKE. *Riverine and Coastal Junks in China's Commerce:* H. J. WIENS. *The Pattern of Population Trends in Massachusetts:* J. LAING.

The Journal of Accountancy

VOL. 100, NO. 1, JULY 1955. *The Tax Practice "Quarrel":* M. E. RICHARDSON. *Renegotiation is here to Stay:* P. M. TRUEGER. *Management Counseling for Small Business Firms:* H. G. BROWN. *Inventory Disclosure in Annual Reports:* J. H. MYERS. *What is a Controller?:* E. B. COCHRAN.

VOL. 100, NO. 2. AUGUST 1955. *Employee Welfare Funds:* H. E. ERB. *Three Major Technical Problems:* G. M. HILL. *The Easy Addition of Numbers in Sequence:* F. T. NEELY. *Will Accounting Education Improve?:* R. K. MAUTZ. *The Decreasing-charge Concept of Cost:* O. S. GELLEIN. *The Pooling of Outside Income:* F. W. BOYDSTUN.

VOL. 100, NO. 3, SEPTEMBER 1955. *Accounting Reform in Washington:* J. W. MCEACHREN. *Fraud, the Accountant and Internal Control:* W. SPRAGUE. *The Intangible Drilling Deduction:* K. G. MILLER. *The Auditor's Dilemmas in Cash-basis Reporting:* H. B. CARLSON. *Projecting Capital Needs:* R. M. ROTHCHILD and P. KIRCHER. *British and American Auditing Differences:* S. A. SENN.

VOL. 100, NO. 4, OCTOBER 1955. *The C.I.T. Case:* S. LEVY. *A Look at the New Look in Federal Taxation:* P. K. WEBSTER. *Notes to Financial Statements:* F. B. FORDERHASE. *Helping the Small Client with Budget Problems:* T. W. LELAND.

Revue d'Économie Politique

VOL. 65, NOS. 4–5, JULY–OCTOBER 1955. *La France Économique en 1954.*

Revue Économique

VOL. VI, NO. 3, MAY 1955. *L'Investissement. Investissement et population:* R. HARROD. *Maximation du profit:* T. SCITOVSKY. *Les opérations financières:* C. HENRY. *Opérations financières et comptabilité économique:* J. DENIZET. *L'expansion économique dans les pays sous-développés:* L. BOURCIER DE CARBON. *Limites de l'investissement global:* P. DIETERLEN.

VOL. VI, NO. 4, JULY 1955. *Théorie moderne des salaires et théorie générale de la répartition:* J. MARCHAL. *Salaire nominal et salaire réel:* S. DANÖ. *Comportement des groupes dans la vie économique internationale:* C. ZARKA. *La fiscalité au Moyen-Orient:* E. GANNAGÉ. *Tarif et trafic au métro de Paris:* R. ROUX.

Revue de Science et de Législation Financières

VOL. XLVII, NO. 3, JULY–SEPTEMBER 1955. *La nationalisation des banques: illusions et réalités:* H. LAUFENBURGER and B. DUCROS. *Les variantes de l'impôt sur le chiffre d'affaires:* J. F. DUE. *Aspects fiscaux de la communauté Européene du Charbon et de l'Acier:* J. MÉRIGOT. *Le budget de développement d'Israel:* K. GRUNWALD. *Le nouveau système financier yougoslave:* D. RACIC.

Journal de la Société de Statistique de Paris

VOL. 96, NOS. 1–3, JANUARY–MARCH 1955. *Nécrologie de M. Charles Rist:* J. RUEFF. *Compte rendu du Congrès de l'Association Française pour l'avancement des Sciences:* J. P. POISSON. *Utilisation des ratios par le crédit populaire:* P. CAUBOUE. *L'importance de la notion de valeur en statistique:* E. VENTURA. *Relations entre la composition des familles et le taux de masculinité:* E. MALINVAUD. *Chronique de démographie:* M. CROZE.

Population

VOL. 10, NO. 2, APRIL–JUNE 1955. *Vue générale et mise au point sur l'économie et la population françaises:* A. SAUVY. *Le congrès mondial de la population: II: Principaux résultats techniques:* L. TABAH. *La génétique de population: principes et applications:* G. MALECOT. *La sécurité sociale et les frontières: formation d'un droit international:* J. DOUBLET. *Le mouvement dans le monde en faveur de la limitation des familles (1945–1954):* J. SUTTER. *La population de la Yougoslavie et ses conditions de développement:* M. MACURA.

Bulletin de l'Institut de Recherches Économiques et Sociales

VOL. XXI, NO. 5, AUGUST 1955. *La formation des tarifs des chemins de fer belges de 1927 à 1939:* E. NOLET DE BRAUWERE. *La formation des prix du chemin de fer de Matadi à Léopoldville, 1898–1954:* A. HUYBRECHTS. *Approches théoriques de la demande de monnaie:* M. FALISE.

VOL. XXI, NO. 6, SEPTEMBER 1955. *La conjoncture économique de la Belgique:* M. WOITRIN.

Annales de Sciences Économiques Appliquées

VOL. 13, NO. 2, MAY 1955. *Aperçu de la conjoncture économique en Belgique. L'analyse et la division du travail:* U. J. VAES. *La théorie mathématique de la réserve technique dans l'assurance incendie:* C. CAMPAGNE. *L'organisation du commerce extérieur de l'U.R.S.S.:* R. O. YAKEMTCHOUK.

Revue de l'Institut de Sociologie

NO. 1, 1955. *Les crises du droit et l'évolution des civilisations:* J. BELIN-MILLERON. *Le problème de l'assimilation:* C. GINI. *Koan-Tse, Homme d'Etat et sociologue chinois du VII^e siècle avant J-C:* B. GRYNPAS. *Valeur monnaie et structuration sociale chez les Nkutshu:* L. DE HEUSCH. *Quelques aspects du régionalisme économique du Royaume:* J. HORN.

Die Weltwirtschaft

NO. 1, 1955. *Weltwirtschaftlicher Überblick. Länderberichte. Marktberichte. Branchenberichte Einzelaufsätze.*

Schmollers Jahrbuch

VOL. 75, NO. 4, 1955. *Das soziologische System von Ferdinand Tönnies:* R. HEBERLE. *Die Geld- und Aussenhandelstheorie im Gleichgewichtssystem der klassischen Nationalökonomie:* F. JONAS. *Die sozio-ökonomische Bedeutung der physiologischen Nahrungsmittelbewertung:* H. SPERLING. *Die Bankenaufsicht als Problem des Verwaltungsrechts und der Verwaltungspraxis:* H. STEINERT.

Wirtschaftsdienst (in German with English Air Mail Digest)

VOL. 35, NO. 6, JUNE 1955. *Can German Industry Afford the 40 hour Week? France's Social Burdens in the Pattern of European Cooperation:* A. FRISCH. *The Austrian Treaty and its Economic Burdens.*

VOL. 35, NO. 7, JULY 1955. *What does German Industry Think of the State of Trade? Fellings and Reafforestation in the West German Forests:* D. CHIU-HSIUNG. *The Nursery Gardens in the Federal Republic:* W. GESLER. *The West German Fruit and Vegetable Processing Industry:* W. HERRMANN.

VOL. 35, NO. 8, AUGUST 1955. *Current Tendencies on the West German Capital Market. The Saar Economy and Article XI of the Saar Statute:* W. E. SCHMITT. *The Prepared Foodstuffs Industry in the Federal Republic:* H. MORGENBESSER. *The Post-war Trend of the Central German Power Industry.*

VOL. 35, NO. 9, SEPTEMBER 1955. *On the Departmental Responsibility for German Commercial Policy. On the Relationship of Market Research to Opinion Research. Integration by Many Paths:* K. ALBRECHT. *The Struggle over the Marketing of Ruhr Coal:* F. GROSSE.

Wirtschaft und Statistik

VOL. 7, NO. 6, JUNE 1955. *Zu den Rechtsgrundlagen der Bundesstatistiken:* K. SZAMEITAT. *Die betriebswirtschaftliche Struktur des Handwerks:* R. SCHULZ.

VOL. 7, NO. 7, JULY 1955. *Der Verbrauch in Haushaltungen von Rentnern und Fürsorgeempfängern in den Jahren 1952 bis 1954:* M. ENGELMANN. *Der Aussenhandel der Bundesrepublik Deutschlands und West-Berlins von 1950 bis Mitte 1955 in kumulativer Darstellung:* P. SCHMIDT. *Die Kostenstruktur im Verkehrsgewerbe:* R. SCHULZ.

VOL. 7, NO. 8, AUGUST 1955. *Der Dividenden der Aktiengesellschaften:* R. BERNDSEN. *Die Investitionen der Gemeinden und ihre Finanzierung:* K. HERRMANN.

VOL. 7, NO. 9, SEPTEMBER 1955. *Das Sozialprodukt im 1 Halbjahr 1955:* K. H. RAABE. *Die betriebswirtschaftliche Struktur des Einzelhandels:* R. SCHULZ. *Die Aufwendungen fur Kinder in Arbeitnehmerhaushaltungen:* P. DENEFF.

Jahrbücher für Nationalökonomie und Statistik

VOL. 167, NOS. 2–3, AUGUST 1955. *Multiplikatorprozess und dynamischer Unternehmergewinn:* E. PREISER; *Bemerkungen:* A. E. OTT. *Sparen und Investieren in der volkswirtschaftlichen Gesamtrechnung:* W. KRELLE. *Sparen, Investieren und wirtschaftliches Gleichgewicht:* H. J. RÜSTOW. *Veränderliche zusammengesetzte Lebenshaltungskostenindexzahlen:* S. VARGA.

VOL. 167, NO. 4, SEPTEMBER 1955. *Betrachtungen zur Unvollkommenheit des Kreditmarktes:* F. U. WILLEKE.

Weltwirtschaftliches Archiv

VOL. 74, NO. 2, 1955. *Der Zahlungsbilanzausgleich bei beweglichem Zins:* H. TIMM. *Die Expansionstheorie und ihr Einfluss auf die Wirtschaftspolitik:* H. P. EGUILAZ. *A Survey of Models for Interindustry Economics:* S. NORDBOTTEN. *Average Expectation of Life as an Index of Civilization:* E. DUNSDORFS.

VOL. 75, NO. 1, 1955. *Die generative Struktur von Bevölkerungen und Sozialschichten:* G. MACKENROTH. *Gerhard Mackenroth und seine Stellung zu den deutschen Sozialwissenschaften:* E. BOETTCHER. *Das Schrifttum von Gerhard Mackenroth. Grundbegriffe der Produktionstheorie vom Standpunkt der Aktivitätsanalyse:* M. J. BECKMANN. *Entrepreneurship in the Initial Stages of Industrialisation:* F. REDLICH.

Zeitschrift für die Gesamte Staatswissenschaft

VOL. 111, NO. 3, 1955. *Carl Brinkmann:* E. VON BECKERATH. *Smith–Hegel–Marx:* H. NANIWADA. *Die Sozialethischen und rechtlichen Wandlungen in der Beurteilung des Armenwesens:* E. KNOLL. *Vom Paradoxon der Ausschliesslichkeit der Kreditschöpfung:* A. FORSTMANN. *Notenbanken im Dienste staatlicher Beschäftigungsfinanzierung:* L. KÖLLNER. *Die Stellung und aufgabe der Rechnungshöfe im neuen deutschen Staatswesen:* B. BANK. *A new Approach to the Phenomena of Disequilibrium and the Acceleration of Derived Demand:* J. K. MEHTA. *Eine Messziffer für Betriebsgrössen:* J. NIEHANS. *Substantive Right and Political Stability:* P. J. FLIESS.

VOL. 111, NO. 4, 1955. *Bemerkungen zur Haushaltsökonomik:* H. HALLER. *Finige Grundprobleme der Ökonometrie:* G. TINTNER. *Zur Theorie der "expansiven Lohnpolitik":* H. SPILKER. *Das Gesetz der qualitativen Entwicklungsfolge im Gesellschaftsorganismus:* J. KASNACICH-SCHMID. *Der Reichskanzler Caprivi: Eine biographische Skizze, Anhang und Quellennachweis:* H. O. MEISNER.

Vierteljahrshefte zur Wirtschaftsforschung

No. 2, 1955. *Zur konjunkturellen Situation:* A. Wissler. *Die Ergebnisse der viersteljährlichen Volkswirtschaftlichen Gesamtrechnung für die Bundesrepublik: Erstes Quartal 1955 mit Zahlenanhang:* H. Schimmler. *Der volkwirtschaftliche Wachstumsprozess in empirischer Sicht:* F. Grünig. *Der Einfluss der Konjunktur in Westeuropa und den Vereinigten Staaten auf den überseeischen und westeuropäischen Handel:* R. Pohl. *Die Wirtschaftslage Grossbritanniens im Zeichen aussenwirtschaftlicher Schwierigkeiten:* M. Teschner. *Die Erzeugungs- und die Geldwirtschaft der sowjetischen Besatzungszone im vierten Jahre des Fünfjahrplanes:* H. Meier.

No. 3, 1955. *Zur konjunkturellen Situation:* I. Rieckenberg and H. Martell. *Die Ergebnisse der vierteljährlichen Volkswirtschaftlichen Gesamtrechnung für die Bundesrepublik: Zwietes Quartal 1955 mit Zahlenanhang:* H. Schimmler. *Die Geldvermögensrechnung im Rahmen der Volkswirtschaftlichen Gesamtrechnung für die Bundesrepublik: Methodik und Ergebnisse für 1950 bis 1954 mit Zahlenanhang:* F. Grünig. *Der Aussenhandel der sowjetischen Besatzungszone Deutschlands als Bestandteil des Ostblockaussenhandels:* G. Conrad. *Über die Kostenstruktur der mitteldeutschen Textilindustrie nach der Wiedervereinigung Deutschlands: Ein allgemeines Probleme behandelt am Beispiel einer Industriegruppe:* W. Moritz.

Allgemeines Statistisches Archiv

Vol. 39, No. 1, 1955. *Internationaler Vergleich der Preise uns der Kaufkraft:* A. Jacobs. *Berechnung wirtschaftlichner Leistungswerte für kleinere Gebietseinheiten:* J. Griesmeier. *Der Messe-test:* J. E. Schwenzner and E. Andersen. *Ausbau der Wahlstatistik des Bundes und der Länder:* W. Hüener. *Studie über die Entwicklung der Bevölkerungsstruktur eines Volkes:* W. Maier.

Europa Archiv

Vol. 10, No. 13, July 1955. *Streitkräfte und Staat:* A. Bergsträsser and T. Eschenburg. *Staatliche Exportförderung—Symptom unserer Zeit:* H. Kahmann and L. Köllner.

Vol. 10, No. 14, July 1955. *Regionale Sicherheitsbestrebungen im Mittleren Osten:* F. Steppat.

Vol. 10, No. 15, August 1955. *Die Stellung Indiens in der Weltpolitik: Eine Uebersicht über die indische Aussenpolitik, 1947–1955:* K. P. Karunakaran. *Das Ende des Kolonialismus und der Aufstieg neuer Nationen in Südostasien: Internationale Folgeerscheinungen der wirtschaftlichen, sozialen und politischen Umwandlung in Asien:* O. Wilson. *Der Kolonialismus in südostasien.*

Vol. 10, No. 16, August 1955. *Voraussetzungen und Verfahren der Wiedervereinigung Deutschlands:* U. Scheuner. *Die Ablösung des Besatzungsstatuts in der Bundesrepublik Deutschland:* H. Maier and A. Tobler.

Vol. 10, No. 17, September 1955. *Schweden und die Gemeinschaft des Westens:* E. Håstad.

Vol. 10, No. 18, September 1955. *Die Entwicklung der europäischen Zusammenarbeit im Verkehr.*

Vol. 10, No. 19, October 1955. *Das Eruopäische Währungsabkommen von 1955:* W. Wabnitz.

Bayern in Zahlen

Vol. 9, No. 7, July 1955. *Bayerns Sozialprodukt im Jahre 1954:* J. Wirnshofer. *Wanderungsverluste an Erwerbspersonen in Bayern 1954:* W. Maier. *Die bayerische Binnenschiffahrt im Jahre 1954:* J. Leipner. *Ergebnisse der Erbschaftsbesteuerung:* R. Schachtner.

Vol. 9, No. 8, August 1955. *Bayerns Grossstädte im Spiegel der Wanderungen:* W. Maier. *Die Todesursachen in Bayern 1954:* C. Mühle. *Die Märkte in Bayern 1955:* J. Raab. *Die bayerischen Viehbestände Mitte 1955:* J. Buck. *Betriebserhebung im Beherbergungsgewerbe zum 1 April 1955:* J. Leipner. *Die Geschäftstätigkeit der Bausparkassen in Bayern 1951 bis 1954:* R. Schneider. *Die öffentlichen Sozialleistungen in Bayern:* A. Herr. *Die Entwicklung der Einzelhandelspreise und des Preisindex für die Lebenshaltung:* H. Schmucker.

Aussenwirtschaft

Vol. 10, No. 3, September 1955. *Betrachtungen zur Aussenwirtschaftspolitik:* H. Bachmann and A. Bosshardt. *Zur Problematik des schweizerischen Kapitalexportes:* E. Küng. *Die Zukunftsaussichten der schweizerischen Baumwollindustrie:* A. Bosshardt. *La mise en valeur des territoires français d'Afrique et la coopération européenne:* P. Dieterlen.

Statistische Vierteljahresschrift

Vol. VIII, No. 1, 1955. *Zur Geschichte der Theorie der Lebenshaltungskostenindizes:* J. Pfanzagl.

Schweizerische Zeitschrift für Volkswirtschaft und Statistik

VOL. 91, NO. 2, JUNE 1955. *Der Beitrag der Soziologie zum Verständnis internationaler Probleme:* R. F. BEHRENDT. *Ein Ausblick auf die ökonometrische Forschungsarbeit:* K. BRUNNER. *Versuch einer kreislauftheoretischen Analyse der bankmässigen Geld- und "Kreditschöpfung":* G. NEUHAUSER. *Logische Analyse und ökonomische Theorie: Eine Antwort und ein Programm:* H. ALBERT.

VOL. 91, NO. 3, SEPTEMBER 1955. *Methoden der Strassenplanung:* R. RUCKLI. *Wirtschaftsfragen des schweizerischen Hauptstrassenbaues:* H. R. MEYER. *Zur Klärung der Beschäftigungstheorie:* M. KRÖLL. *Contribution au calcul simplifié des pertes de potentiel-vie causées par l'avancement en âge de la population:* R. SAILER. *Zusammenarbeit mit wirtschaftlich unterentwickelten Ländern:* O. M. UHLER. *Probleme des Lebenskostenindex in Grossbritannien:* W. ZELLER.

Zeitschrift für Nationalökonomie

VOL. XV, NO. 1–2, 1955. *Economic Progress: German translations of the papers prepared for a conference of the International Economic Association in 1953.*

Monatsberichte des Österreichischen Institutes für Wirtschaftsforschung

VOL. XXVIII, NO. 5, MAY 1955. *Die wirtschaftliche Lage in Österreich. Österreichs Stellung im westeuropäischen Export.*

VOL. XXVIII, NO. 6, JUNE 1955. *Die wirtschaftliche Lage in Österreich. Die maschinellen Bruttoinvestitionen der österreichischen Landwirtschaft.*

VOL. XXVIII, NO. 7, JULY 1955. *Die wirtschaftliche Lage in Österreich. Die Frachtbelastung der österreichischen Importe.*

VOL. XXVIII, NO. 8, AUGUST 1955. *Die Österreichische Konjunktur zu Beginn der Herbstsaison 1955.*

VOL. XXVIII, NO. 9, SEPTEMBER 1955. *Die wirtschaftliche Lage in Österreich. Die Kommassierung.*

Ekonomisk Tidskrift

VOL. LVII, NO. 2, JULY 1955. *Instrumental doktrinhistoria:* J. ÅKERMAN. *Terms of trade och handelsbalansen:* S. B. LINDER. *Några anmärkningar om autonoma och inducerade förändringar i terms of trade för ett litet land:* K. M. SAVOSNICK.

VOL. LVII, NO. 3, SEPTEMBER 1955. *Arbejdsløn og arbejdsmaengde:* F. ZEUTHEN. *En grundläggande modell för nationalbudgetering:* B. KRAGH. *Om sambandet mellan terms of trade och bytesbalans:* H. DICKSON.

Skandinaviska Banken Quarterly Review

VOL. 36, NO. 3, JULY 1955. *Ten Years of Peace:* P. JACOBSSON. *The Surplus in Swedish Agricultural Production:* L. JURÉEN. *Recent Development of the Icelandic Economy:* B. EIRIKSSON.

Nationaløkonomisk Tidsskrift

VOL. 93, NOS. 1–2, 1955. *Finansieringen af investeringerne:* V. KAMPMANN. *Bankloven og Banklovforslaget:* J. MOE. *Økonomisk vaekst:* N. RASMUSSEN. *Om Valutakurspolitik:* J. H. GELTING. *Ny Hovedopstilling af Statsbudgettet:* C. L. THOMSEN.

De Economist

VOL. 102, NO. 6, JUNE 1955. *Enkele begrippen, methoden en problemen uit de macro-economie:* G. T. J. DELFGAAUW. *Monetetair evenwicht en inkomensevenwicht:* F. J. DE JONG. *Opmerkingen en aantekeningen:* H. W. J. BOSMAN, J. J. J. DALMULDER and P. B. KREUKNIET.

VOL. 102, NOS. 7–8, JULY–AUGUST 1955. *Complementaire interesttheorieën: I:* F. DE ROOS. *Monetair evenwicht en inkomensevenwicht:* F. J. DE JONG. *Opmerkingen en aantekeningen:* J. A. COLTOV.

VOL. 102, NO. 9, SEPTEMBER 1955. *Complementaire interesttheorieën: II:* F. DE ROOS. *Nieuwe stappen op de weg naar een vrij intra-Europees goederenverkeer:* D. C. BREEDVELD. *Opmerkingen en aantekeningen.*

Giornale degli Economisti e Annali di Economia

VOL. XIV, NOS. 1–2, JANUARY–FEBRUARY 1955. *Sulla dipendenza della composizione per età di una popolazione dalla mortalità:* G. MORTARA. *Nuove applicazioni della teoria economica della produzione:* S. RICOSSA. *Esperienze di geografia applicata:* U. TOSCHI. *Su quali linee razionali sia possibile una nuova regolamentazione delle farmacie in Italia:* G. DEMARIA.

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Economia Internazionale

VOL. VIII, NO. 3, AUGUST 1955. *Esame critico della definizione corrente di reddito nazionale:* P. BATTARA. *Productivity, the Trade Balance and the Terms of Trade:* H. J. BRUTON. *Income Taxation, Output, and Prices: I: Impact Effects:* C. A. HALL and J. TOBIN. *Benelux: an Experiment in Economic Integration:* J. WEMELSFELDER.

Banca Nazionale del Lavoro Quarterly Review

NO. 32, MARCH 1955. *Operating Costs of the Italian Banks:* M. MAZZANTINI. *Post-war Monetary Policy in France:* J. S. G. WILSON. *Cost Analysis and Cost Forecasting in the Bank:* P. CASTIGLIONI. *Invalidity, Old-age and Survivors' Compulsory Insurance in Italy:* G. PAPA. *Australian Post-war Immigration:* D. COCHRANE.

NO. 33, JUNE 1955. *Regulation of Crude Oil Production in the United States and Lessons for Italy:* A. E. KAHN. *Fixed Parities and International Order:* M. A. HEILPERIN. *Competition among Banks in France and the Fixing of their Rates:* P. CAUBOUE. *The Second Inquiry into the Labour Force in Italy:* G. RUFFOLO.

Review of the Economic Conditions in Italy

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VOL. IX, NO. 4, JULY 1955. *Development of Employment and Income in Italy:* E. VANONI.

Critica Economica

NO. 3, JUNE 1955. *I monopoli industriali in Italia:* G. LUZZATTO. *Sulla struttura monopolistica:* G. PALOMBA. *Sul "Piano Vanoni":* B. MANZOCCHI. *La struttura monopolistica dell'economia italiana:* L. CONOSCIANI.

NO. 4, AUGUST 1955. *La crisi in agricoltura e la questione dei contratti agrari:* G. VITALE. *Convertibilità monetaria, investimenti esteri, occupazione interna:* P. VALLE. *Cooperazione e monopoli:* W. BRIGANTI.

Italian Affairs

VOL. IV, NO. 4, JULY 1955. *Italo-French Trade. Activities Carried out by Organs of the Land Reform. Agriculture in 1954. The Growth of Population in Rome. Industrial Production in 1954. The Iron and Steel Industry. Public Undertakings and Social Improvements in Sicily.*

VOL. IV, NO. 5, SEPTEMBER 1955. *Message of the President of the Republic to the Italian People. Summary of Social Security in Italy. Prices, Wages and the Cost of Living. Food Consumption. Technical and Vocational Education. State Tobacco and Salt. The Automobile Industry. Olive Cultivation and the Olive Oil Industry. Progress in the Task of Rural Development. Land Reform in Sardinia. Cotton in Italy.*

L'Industria

NO. 2, 1955. *La matematica in economica:* W. LEONTIFF. *E'opportuna in Italia, una politica antidepressiva contro i cicli brevi :* DI FENIZIO. *Determination du volume du chiffre d'affaires et de la domande de laine en France de 1946 à 1952:* M. VERHULST and C. FOURGEAUD. *La relazione generale sulla situazione economica del Paese nel 1954:* A. GIANNONE.

Boletin de Estudios Economicos

VOL. X, NO. 35, MAY 1955. *La Participacion de los Obreros en el Reparto de la Renta Nacional de Postguerra 1936–1952:* E. M. RECIO. *Doctrinas Economicas del P. Juan de Mariana, S.J.:* C. S. ESTÍVARIZ. *El Origen de la Concepcion Mecanista de la Estructura Economica:* R. P. GRAU. *Un Plan Decenal de Inversiones en Italia:* J. M. SÃENZ.

Revista de Economia

VOL. VIII, NO. 1, MARCH 1955. *Aspectos estruturais da economia corticeira:* U. F. NASCIMENTO.

Economic Bulletin of the National Bank of Egypt

VOL. VIII, NO. 2, 1955. *No Inflation. The Boom Continues. Convertibility. Egypt's Balance of Payments for 1954. Development of Egyptian Joint Stock Companies. Budget Estimates for 1955/6.*

Moneda y Credito

NO. 53, JUNE 1955. *El Plan Monnet de Francia:* A. ROBERT. *Los Convenios entre España y los E.E.U.U.:* I. C. GARRIGOS. *La extraña asociación de Harriet Taylor y John Stuart Mill:* F. ESTAPE.

NO. 54, SEPTEMBER 1955. *El método del facto-producto: Una applicacion a la economia italiana:* P. D. HENDERSON. *El desarrollo de las inversiones en España:* H. P. EGUILAZ. *La banca española en 1954:* I. C. GARRIGOS. *Sobre el nuevo concepto del "poder compensador":* L. B. FLOREZ.

El Trimestre Economico

VOL. XXII, NO. 1, JANUARY–MARCH 1955. *La elasticidad de la oferta y el desarrollo economico:* H. F. DE LA PEÑA. *El régimen agrario y el funcionamiento de los mercados de factores:* C. M. CASTILLO. *El primer plan quinquenal de la India:* M. S. WIONCZEK. *La utilización de especialistas en Ciencias Sociales en América Latina:* M. N. MORALES.

VOL. XXII, NO. 2, APRIL–JUNE 1955. *La incidencia del régimen venezolano de cambios diferenciales:* C. R. SILVA. *Los conflictos de trabajo en México, 1937–1950:* G. R. MARÍN. *Taraco: Monografía de un latifundio del altiplano boliviano:* E. FLORES. *Una hipótesis sobre el origen del capitalismo:* J. BAZANT.

The Annals of the Hitotsubashi Academy

VOL. V, NO. 2, APRIL 1955. *The Role of Price Dispersion:* R. IOCHI. *An Estimate of Capital Formation in Japan by "Commodity Flow" Method:* M. SHINOHARA. *Jurisprudence and the Sociological Method—in particular reference to the theory of labor legislation:* M. AZUMA. *Shipping Business and its Technical Requirements:* T. CHIDA. *Der Sozialcharackter der Sozialversicherung:* R. OBAYASHI.

Osaka Economic Papers

VOL. III, NO. 2, 1955. *An Understanding of Neutral Expense—A Problem of the Relation between the Science of Business Administration and Economics:* K. MESAKI. *Key Ideas of Mercantilist Economic Thought:* S. SOBAJIMA. *"Kabunakama," Corporation des Marchands du Temps des* Tokugawa, *son Organisation et ses Fonctions:* M. MIYAMOTO. *Monopoly and Inflation in Contemporary Japan:* M. BRONFENBRENNER.

VOL. III, NO. 3, 1955. *Power and Economy—Some Counter-criticisms on Power Theory in Economics:* Y. TAKATA. *Positive and Negative Relations and Stability Conditions:* M. SONO. *A Problem of Small and Medium-sized Businesses in Japan:* K. MESAKI. *Notes on Non-linear Business Cycle Theories:* S. ICHIMURA.

The Economic Review (in Japanese)

VOL. 6, NO. 2, APRIL 1955. *Some Thoughts on the Natural Rate of Growth:* Y. TAKADA. *The Reproduction of Fixed Capital and Investment Decision:* C. TAKAHASHI. *Political Arithmetic in the 17th Century:* S. MATSUKAWA.

VOL. 6, NO. 3, JULY 1955. *Karl Marx's Intention in* Theorien über den Mehrwert: S. SUENAGA. *Efficient Paths of Dynamic Input-Output Processes:* M. FUKUOKA. *Equilibrium in International Trade: a Diagrammatic Analysis of the Case of Increasing Cost:* K. KOJIMA. *Intertemporal Efficiency in the Process of Capital Accumulation:* H. FURUYA.

Statistikai Szemle (Hungarian Text)

JUNE 1955. *Index Numbers of Labour Productivity in Agriculture:* B. BRAGINSKY. *The Disproportionate Wages of Workers in Some Branches of the Economy and their Causes:* K. SÁNDOR. *On Certain Methods for Analysing Expenditure on Materials:* L. TÜÜ and T. PÉTERFFY. *How do Different Engineering Firms Interpret the Complete Fabrication of Products?:* G. BÁCS.

JULY 1955. *The Evolution of the Premium Wage System and its Effect in Industry:* J. LACFALVI. *The Demographic Expansion of Underdeveloped Countries and Neomalthusianism:* J. RÉDEI. *On the Examination of Crop Fields:* L. PINTER. *The Expansion of the Brick Industry Since Liberation:* G. REJTÓ.

Voprosy Ekonomiki (*Russian text*)

NO. 6, 1955. *Technical Progress and Economies in Production:* N. NEKRASOV. *The Influence of Technological Progress in Industry Upon Raising the Cultural–Technical Level of the Workers:* O. KOZLOVA. *Cost Accounting and the Material Stimulation of the Industrial Worker:* E. LIBERMAN. *Economic Problems of Diesel Electric Traction on U.S.S.R. Railways:* V. DMITRIEV. *M.T.S. as the Most Important Lever of State Direction of Collective Farms:* V. BUDAGOV. *The Economic Content of the Basic Indicators of Stockbreeding Development:* A. BRYNSKY. *The Collective Farm on the Way Up:* V. MERZLYAKOV. *The Scientific Bases of Planning the Chinese Economy:* SU SIN. *The Fight for the Upsurge of Agriculture in the European People's Democracies:* V. ZOLOTAREV and B. ISAEV. *Progressive Economic Thought in France in the Struggle Against Reactionary Ideologies and Policies:* E. PLETNEV. *Some Peculiarities of Reproduction of Equipment in Capitalist Countries:* I. YASNOVSKY. *The Economic Expansion of the U.S.A. in Japan and the Aggravation of Japanese–American Differences:* A. DINKEVICH.

Planovoe Khozyaistvo (*Russian text*)

NO. 3, 1955. *The Reorganisation of Gosplan and the Tasks for Improving Economic Planning. The Introduction of Advanced Technology into all Branches of the Economy Is the Most Important Task of Engineering:* N. PEROVSKY. *The Improvement of Labour Productivity in Socialist Agriculture:* A. BOLGOV. *Problems of the Fuel Balance of the U.S.S.R.:* D. MASLAKOV. *Ways to Improve the Use of Productive Capacity in Industrial Enterprises:* S. SEMIN. *Tasks for the Further Improvement of Credit-finance and Accounting in the National Economy:* M. USOSKIN. *Planning the Gross and Net Output of Industry:* O. GERSHANOVSKY and M. POLIKARPOV. *From Experience in Liquidating Irrational Freights:* G. KOSHAREV.

NO. 4, 1955. *A Fighting Programme of Action for the Soviet Nation. Reserves for Increasing Labour Productivity in the Coal Industry:* M. KUNDIN. *Increase the Application of Gas Fuel in the National Economy:* Z. CHUKHANOV. *On the Introduction of Advanced Technical Processes in Engineering:* I. ABRAMOV. *Reserves for a Rise in Building Productivity:* N. MAKSIMOV. *Problems of the Specialisation of Production in the Long-term Development of Agriculture:* V. NEMICHINOV. *The Combined Technical, Industrial and Financial Plan of an Enterprise—an Instrument for the Mobilisation of Reserves:* D. SANKIN.

Finansy S.S.S.R. (*Russian text*)

NO. 3, 1955. *The 1955 State Budget and the Tasks of Financial Organs:* A. ZVEREV. *Improve Investment Finance:* I. SUPRUNENKO. *Reserves for Lowering the Cost of Building Dwellings and Social Amenities:* V. DYSKIN. *Perfect the Financial Operation of Industrial Enterprises:* G. BOGUN. *Some Problems in Improving Control and Inspection Work on the Spot:* T. ROGOV. *The Financial System in the Service of Hungarian Economic and Cultural Construction:* V. BOCHKOVA. *Analysis of Fulfilment of Profit Plans of Industrial Enterprises:* V. KOPNYAEV. *The Expansion of U.S. Financial Capital in the Colonies of Small European States:* M. KOGAN.

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NO. 6, 1955. *Strengthen Control by the Rouble in Industry. Internal Reserves in the Fuel Industry:* P. MOROZOV. *For a Further Increase in the Profitability of Engineering Enterprises:* P. ZHEVTYAK. *Fully and Promptly Ensure the Payment of Loan Subscriptions into the Budget:* P. DMITRICHEV. *Forest Fees: An Important Source of Revenue in the State Budget:* D. ANDROSOV.

The Role of the Budget in Economic and Cultural Construction in Moscow Oblast: M. ZAKHAROV. *Assist in Every Way the Development of Agriculture:* A. LOSEVA. *The State Budget and the Development of the Economy and Culture of Poland:* T. DIETRICH. *Analysis of Plan Fulfilment of Municipal Enterprise Production:* V. BARMIN. *Some Problems in the Financial Policy of Britain:* L. DROBOZINA.

No. 7, 1955. *Fulfil the Plan for Direct Taxes. Constantly Improve Staff Training:* A. KHARIONOVSKY. *For a Further Increase in Accumulation in Engineering:* P. GULYAEV. *Overhead Expenses in Socialist Industry:* L. KANTOR. *Inspection—An Important Source for Improving the Activity of Financial Organs and Economic Organisations:* S. TARUNYAN. *Economic Work in Industrial Bank Offices:* V. KARABEKOV. *Money Income and the Indivisible Funds of Collective Farms:* S. KORYUNOV. *Analysis of the Fulfilment of the Production Programmes of Enterprises:* M. RUBINOV.

Dengi i Kredit (*Russian text*)

No. 4, 1955. *Lenin on the Role of Money, Credit and Banks in Building Communism:* A. GUSAKOV. *Increase the Functions of Credit in Heavy Industry:* M. PESSEL. *An Unsolved Problem:* A. KOZHEVNIKOV. *More Attention Should be Paid to State Bank Branches in the Virgin Land Areas:* N. KARASAEV. *The Financial Operations of Enterprises Must be Equal to their New Tasks:* G. KNOPOV. *The Strengthening of the Money System of China and the 1955 Reform:* A. ZYKOV.

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Vestnik Statistiki (*Russian text*)

No. 1, 1955. *Problems in the Analysis of the Financial Situation of Industry:* S. BARNGOLTS. *The Computation of Index Numbers of Variable and Constant Components:* N. RYAVZOV. *For a Further Improvement and Simplification of Accounting and Reporting: The Problem of Decreasing Reporting Obligations:* I. TARASOV. *Lenin on the Creation of Statistical Organs in the U.S.S.R.:* I. SHULGIN. *The World Population Conference:* T. RYABUSHKIN. *Smoothing a Time Series by the Method of Least Squares:* P. MASLOV.

No. 2, 1955. *The Constant Rise of Socialist Production. Index Numbers of Labour Productivity in Agriculture:* B. BRAGINSKY. *Problems of Classifying Production:* F. FEDOROV. *From the History of Russian Statistics:* L. ROZOVSKY. *The Eighth International Conference of Labour Statisticians:* T. RYABUSHKIN. *How to Define the Magnitude of Livestock Production:* A. BRYANSKY. *Republican Meetings of Statisticians:* N. SCHASTNEV.

Plánované Hospodářství (*Czech text*)

No. 5, 1955. *For Further Mechanisation and Electrification of Agriculture:* J. MATOUŠEK. *Planning Wholesale Prices in Engineering:* J. TYPOLT. *Economic Location in Czechoslovakia:* O. ŽUREK. *Further Improve Planning of Building:* O. STIBOR and V. KUBISTA. *Planning Retail Turnover:* J. PÁTEK and J. NESNÍDAL.

Gospodarka Planowa (*Polish text*)

No. 6, 1955. *Development Trends of the Chemical Industry in the Five-year Plan:* M. NIESIOLOWSKI. *Methodological Changes in Elaborating the Draft Economic Plan for 1956:* S. HATT and E. SZYMAŃSKI. *The Theory and Practice of Local Economic Planning as Applied to the 1956 Plan:* C. BIELECKI. *The Main Elements in the Methodology of Planning Investments:* B. BALIŃSKI. *On Making Use of the Law of Value in Planning Consumer Goods Prices in a Socialist Economy:* J. PAJESTKA. *On the Eve of a New Stage in Livestock Breeding:* M. MARKIJDNOWICZ. *The Remilitarisation of Germany and the Economic Prospects of Western Europe:* J. ZDANOWICZ.

No. 7, 1955. *The Operation of the Basic Economic Law of Socialism and the Socialist Industrialisation of People's Poland:* J. NIEGOWSKI. *On the Need for Rapid Technological Progress:* J. KOPIŃSKI. *The Industrialisation of Building:* M. MALACHOWSKY. *Some Problems in the Supply of Technical Materials:* Z. DEUTSCHMAN. *The Way to Render the*

Management of Materials in the Textile Industry More Efficient: A. KWIATKOWSKI. *The Importance of Improving Planning and Reporting in the Struggle for Lowering Production Costs in Industry:* C. NIEWADZI. *The Methodology of Planning and Accounting Costs in State Farms:* B. UTZIG and S. STOPIŃSKI. *The Size of a Socialist Farm:* R. MANTEUFFEL and J. KOSICKI. *Some Financial Problems of Agricultural Producer Co-operatives:* M. WERALSKI. *The Rebirth of Monopolies in Western Germany:* M. TOMALA. *Some Indexes of Animal Production in the U.S.S.R. and Poland:* J. POTEMKOWSKI.

No. 8, 1955. *On the Economic Criteria of Obsolescence:* B. MINC. *For a Higher Efficiency of Labour in Coal Mining:* Z. TWAROWSKI. *The Main Problems in the Development of Engineering in the Five-year Plan:* T. JANKOWSKI. *Water Supply in the Five-year Plan:* Z. MIKUCKI. *The Use of Sewage for Agricultural Needs:* J. WIERZBICKI. *How to Reduce Losses in Grain:* W. KOZAK. *Scientific and Technological Documentation as an Instrument of Technical Progress:* W. BALIŃSKI. *Correct the Planning of Goods Turnover:* M. SKRZYMOWSKI. *American "Aid" to Asia:* Z. DOBRSKA.

Planovo Stopanstvo (*Bulgarian text*)

No. 3, 1955. *Lenin on Socialist Industrialisation. Reserves in Using Productive Capacity in Industry:* N. NIKOLOV. *How to Strengthen Economic Accounting in Industry:* D. DAVIDOV. *The Contractual Systems and their Significance in Economic Relations between Industry and Agriculture:* N. KOLEV. *For Regular Money Advances to Co-operatives:* F. BAILOV. *Financial Control in Building:* G. SHOPOV.

No. 4, 1955. *For Maximum Economy in the Use of Materials in Industry:* R. RUSEV. *The Struggle to Eliminate Uneconomic Freights:* M. ENEV. *Improve Cost Planning in Industry:* S. KALINOV. *Working Norms in Gathering the Harvest and Incentives for Co-operative Farms to Improve the Quality of the Crop and to Gather it Earlier:* V. TSANOV. *Socialist Accumulation and the National Economic Balance:* I. MALYSHEV. *A Major Decision of Improving National Economic Planning:* P. TOPCHIEV. *Planning Foreign Trade:* A. PANOV. *The Development of Albania Towards Socialism:* G. POPISAKOV.

Probleme Economice (*Rumanian text*)

No. 5, 1955. *Two Trends in Economic and Political Development Since the Second World War. The Reduction of Retail Prices—An Important Factor in Raising the Standard of Living of the Workers. The Nature of Tendencies in Objective Economic Laws:* H. KOHN. *Some Problems in Organising Production in Metallurgical and Engineering Enterprises:* H. STERIAN. *For a Decrease in Construction Costs:* I. VIRGIL. *The Rational Use of Tractors and Equipment on M.T.S.:* O. POPA. *Some Problems in Supplying Raw Materials to the Food Industry:* E. TRATTNER. *Some Current Aspects of Inflation in Capitalist States:* E. CAȘEVSCHI. *On Socialist Reproduction:* C. SABIN.

No. 6, 1955. *Socialist Competition—An Important Aid to Attaining the Industrial Plan in All Its Indicators:* M. VOICU. *Reserves for Increasing Labour Productivity in Engineering:* C. BĂRBULESCU and D. JOIȚA. *Some Aspects of the Regional Distribution of Agricultural Production:* V. PASCOVSCHI. *Aspects of the Subjugation of Rumania Under the Bourgeois–Landlord Regime By Means of Foreign Trade:* N. IANOVICI. *The Struggle of the Peoples of Asia and Africa Against Colonialism:* L. STROJA. *Improving the Methodology of Calculating Labour Productivity in Industry:* A. GLÜCK. *The Socialist System of Agriculture:* B. ZAHARESCU.

No. 7, 1955. *The Lenin Theses on the Improvement of Goods Exchanges Between Town and Country in the Period of Transition from Capitalism to Socialism:* C. FLORESCU and L. DEAK. *The Rumanian State Budget in the Service of Building Socialism:* A. GHEORGHIU. *The Rationalisation of Fuel Consumption:* I. SAFIR. *Some Problems in the Development of Local State Industries:* O. DOBRESCU. *The Importance of the Systematisation and Organisation of the Agricultural Area as a Means to Raising Rumanian Agricultural Output:* A. ROMANOVICI. *Conditions Created for Small Scale Commodity Production in Agriculture and the Possibilities of Expanding Production in This Sector:* D. MARIN. *Commodity Production and the Law of Value Under Socialism:* A. NEGREA.

Ekonomist (*Serb text*)

No. 1, 1955. *A Means of Remedying Agrarian Overpopulation:* K. MILJOVSKI. *A Projection of the Structure of the Jugoslav Labour Force and Population:* M. MACURA. *Problems of Dwelling Construction and Finance in Jugoslav Towns:* D. STEFANOVIĆ. *Marx's Law of Value:* Z. PJANIĆ.

NEW BOOKS

British

BANKS (J. A.) and OSTERGAARD (G. N.). Co-operative Democracy. Co-operative College Papers, No. 2. Loughborough: Co-operative Union (Stanford Hall), 1955. 9″. Pp. 63. 1*s*.

[The subject of this study is the problem of membership apathy in the Co-operative Movement. The authors undertook two inquiries. The first was concerned with a group of societies for which comparison with 1933 was possible. It is found that the average proportion of members attending general meetings fell from 1·53% in 1933 to 0·25% in 1954. There was also a fall, though not such a large one, in the proportion of members voting in elections of Management Committees. A number of changes since 1933 in methods of conducting business are described. The second inquiry was a more intensive case study of elections in an individual Society in the Midlands. Statistics relating to these elections are examined from various standpoints. The intention was to supplement the statistical data by a questionnaire issued to the voters, but unfortunately only a small proportion of the questionnaires were returned, and the results could therefore be taken as at best no more than an indication of views held by the more active members. The authors point out that relatively little empirical work of the type represented by their inquiries has hitherto been done on the Co-operative Movement, and they conclude by indicating some further subjects of research that are suggested by their findings.]

BENHAM (F.). Economics. Fifth edition. London: Pitman, 1955. 9″. Pp. 568. 18*s*.

[To be reviewed.]

BENNETT JONES (R.). The Pattern of Farming in the East Midlands. Loughborough: University of Nottingham School of Agriculture (Department of Agricultural Economics, Sutton Bonington, Loughborough), 1955. 9½″. Pp. 174. 6*s*.

[This contains a comprehensive classification of farms by size, type, etc., based on information taken from official agricultural returns for the region. These returns are complete, so the result is not a sample survey. Classification in such detail has not often been attempted before in this country. The author supplements his statistics by a series of maps.]

BISSET (G. B.). Financial Results on Farms in the Southern Province in 1951–52 and 1952–53. Farm Management Survey Report No. 4. Reading: University of Reading Department of Agricultural Economics, 1954. 9½″. Pp. 31. 5*s*.

[This is the fourth in a series of reports prepared by the Department of Agricultural Economics at Reading University. The statistics shown relate to production, expenditure, capital investment, output per unit of different inputs, and net income. Average net income per 100 acres in the farms in the sample fell from £397 in 1951/52 to £295 in 1952/53, because of poorer crop yields and rises in costs.]

BURNSIDE (E.) and STRONG (W. M.). An Economic Study of Pig Production in South West England, 1953–4. Newton Abbot: Department of Agricultural Economics, University of Bristol, 1955. 9″. Pp. 40. 2*s*. 6*d*.

[The chief conclusion reached is that costs of feeding were of paramount importance in determining the financial results of the farms studied. An analysis is given of the main factors affecting feeding costs per unit of output. Attention is also paid to the quality of pig produced, which, it is suggested, is likely to become more important as free market conditions come to be fully restored.]

CHANDRASEKHAR (S.). Population and Planned Parenthood in India. London: Allen & Unwin, 1955. 9″. Pp. vii + 108. 12*s*. 6*d*.

[The first two chapters provide a summary of the facts relating to the growth of India's population during the present century and a lucid brief discussion of the causes affecting fertility and mortality. Most of the rest of the book is concerned with the prospects of extending the practice of birth control in India. The author discusses the difficulty of evolving reliable contraceptive techniques appropriate to Indian conditions and of educating people in their use. After describing the work at present being done in India to spread knowledge of birth control, he ends with a plea for intensification of effort in this direction.]

Colonial Students in Britain. A Report by P.E.P. London: Political and Economic Planning (16 Queen Anne's Gate, S.W.1), 1955. 9″. Pp. 257. 21*s*.

[This is based on systematic fieldwork amongst colonial students in Britain, including a large-scale sample survey. Quotations from the actual words of the students' replies are much used. Only about a third of the students were at universities; the remainder were studying at Inns of Court, technical colleges and other institutions. The disappointments and frustrations experienced

by so many of the students make this a rather depressing study, although it must be remembered that some of these difficulties are experienced by other overseas students as well, and even by British ones—for example the loneliness of many students in lodgings in London. The authors make a series of recommendations designed to enable the colonial student to profit more from his stay in this country. They attach much importance to the proper selection of students and to adequate preparation and advice being given before they leave their homes.]

DAVISON (R. B.). Migrant Labour in the Gold Coast. A pilot survey. Achimota: Department of Economics, University College of the Gold Coast, 1954. 13″. Pp. 41. 3*s*. 6*d*.

[This report describes the findings of a survey undertaken in March 1954 at one of the major ferries across the Volta. Information was sought on the number of travellers northwards, their characteristics (age, nationality, tribe), employment while in the south, frequency and duration of migration, and a number of other points. All those buying ferry tickets for the northward passage were interviewed. Some valuable results were reached, but a fair amount of the data collected had to be rejected, because the five different interviewers obtained such divergent results that fatal biases in observation had to be inferred. This applied especially to questions relating to time (*e.g.*, age, duration of stay in the south), which evidently presented great difficulties to illiterate migrants.]

DONALD (M. B.). Elizabethan Copper. The history of the Company of Mines Royal, 1568–1605. London: Pergamon Press, 1955. 9″. Pp. 405. 60*s*.

[The Company of Mines Royal was the first company formed in England for purposes of production as distinct from commerce. Professor Donald, who is Professor of Chemical Engineering in the University of London, here provides a detailed narrative of its history. With the aid of much quotation from the contemporary sources, he describes the personalities involved in the enterprise, the financial and technical difficulties that were faced and the company's ultimate decline. He attributes this decline chiefly to failure to train English workers in the skills of the German technicians who were introduced to manage the work at the beginning. "When the Germans died their skill died with them and at the end of the Elizabethan period the mines languished."]

EASTHAM (J. K.) (Ed.). Economic Essays in Commemoration of the Dundee School of Economics, 1931–1955. London: The Economists' Bookshop (11 & 12 Clement's Inn Passage, W.C.2.) for the School of Economics, Dundee, 1955. 10½″. Pp. 103.

[The Dundee School of Economics was founded by a private benefaction in 1931 and was run as an independent institution under the trusteeship of the Dundee Corporation until this year. The recent reorganisation of university education in Dundee and St. Andrews has led to the disappearance of the School as a separate body and its incorporation into Queen's College, Dundee, one of the two constituent colleges of the University. The present volume of six essays by distinguished economists who have at one time or another been on the staff of the School is published "in commemoration of an educational experiment which has achieved the first objectives of its founder and is about to embark on a further stage of development." The six essays are: "Wicksell's Principle in the Distribution of Taxation," by Duncan Black; "The Postal Monopoly in Great Britain: an historical survey," by R. H. Coase; "A Redefinition of the Boundary between Interest and Profit Theories," by J. K. Eastham; "Professor Hayek's Contribution to Trade Cycle Theory," by J. C. Gilbert; "Scottish Trade with the Baltic, 1550–1560," by S. G. E. Lythe; and "Advertising Costs in Monopolistic Competition," by T. H. Silcock.]

FRANKEL (H.). Controls and Subsidies on Agricultural Products and Requisites: Wool, 1939–54; Barley, Oats, and Rye 1939–54. Supplement to the *Farm Economist*, Vol. VII, No. 9. Oxford: Agricultural Economics Research Institute, 1954. 8½″. Pp. 54. 2*s*.

[This is the last of a series of papers by Mr. Frankel on controls and subsidies on agricultural products and requisites since 1939. The previous papers were reviewed by Mr. C. H. Blagburn in the ECONOMIC JOURNAL, September 1955, pp. 531–3. It gives a detailed account of the supplies and prices of the four products named and of the associated legislation, controls and subsidies. Special interest attaches to the case of wool, since policy in regard to it has had certain unusual features. Notable among these was the practice of calculating a subsidy estimate by comparison with the equivalent prices of imports. Wool is the only commodity for which this was done.]

GILBERT (M.) and STONE (J. R. N.) (Eds.) for the International Association for Research in Income and Wealth. Income and Wealth, Series IV. London: Bowes & Bowes, 1955. 9″. Pp. 386. 42*s*.

[To be reviewed.]

HAGUE (D. C.) and STONIER (A. W.). The Essentials of Economics. An introduction and outline for students and for the general reader. London: Longmans, 1955. 9″. Pp. ix + 173. 12*s*. 6*d*.

[To be reviewed.]

HAWTREY (R. G.). Cross Purposes in Wage Policy. London: Longmans, 1955. 7½". Pp. 148. 7*s*. 6*d*.

[To be reviewed.]

HAYCOCKS (H. W.) and PERKS (W.). Mortality and other Investigations, Volume I. London: Cambridge University Press, 1955. 9". Pp. vii + 164. 20*s*.

[This is published as an officially prescribed text-book for the examinations of the Institute of Actuaries. It describes the procedures adopted by actuaries for the calculation of rates of mortality and sickness and similar purposes.]

HOBSON (O. R.). How the City Works. Revised edition. London: News Chronicle, 1954. 7½". Pp. 160. 6*s*.

[This extremely lucid and readable introduction to banking, finance and the other activities of the City of London was first published in 1938. The present edition has been completely revised, but the author suggests that with the progressive relaxation of controls the principles on which the City operated before the war have now come increasingly into their own again.]

HOFFMANN (W.). British Industry 1700–1950. Translated from the German by W. H. Chaloner and W. O. Henderson. Oxford: Basil Blackwell, 1955. 9". Pp. xx + 338. 35*s*.

[To be reviewed.]

JÖHR (W. A.) and SINGER (H. W.). The Role of the Economist as Official Adviser. Translated from the German by J. Degras and S. Frowein. London: Allen & Unwin, 1955. 9". Pp. v + 150. 15*s*.

[To be reviewed.]

KENDALL (M. G.). Rank Correlation Methods. Second edition, revised and enlarged. London: Charles Griffin, 1955. 9". Pp. 196. 36*s*.

[This is a second edition of a now well-known book; the first edition was reviewed by Mr. R. C. Geary in the ECONOMIC JOURNAL of December 1949. The new edition has been revised extensively, though the original plan is unchanged. New material has been introduced and a new chapter added, dealing with advances in ranking theory and a review of recent developments in its application. There is also a new table of random permutations of the first twenty natural numbers.]

LEWIS (W. A.). The Theory of Economic Growth. London: Allen & Unwin, 1955. 9". Pp. 453. 30*s*.

[To be reviewed.]

LITTLE (L. T.). A Handbook for Economics Students. London: Jordan & Sons, 1955. 7½". Pp. 181. 7*s*. 6*d*.

[To be reviewed.]

LYDALL (H. F.). British Incomes and Savings. Oxford University Institute of Statistics, Monograph No. 5. Oxford: Basil Blackwell, 1955. 10". Pp. 274. 32*s*. 6*d*.

[To be reviewed.]

MATHER (L. C.). The Lending Banker. A review of the principles of bank lending, unsecured advances and balance sheets and the banker. London: Waterlow & Sons, 1955. 9½". Pp. 99. 8*s*. 6*d*.

[This is a reprint of articles that have appeared in *The Bankers' Magazine* over the last two years. It is designed for the guidance of bank managers and prospective bank managers in the principles of lending. It will, however, also be of interest to economists, as an indication of the practices and procedures which banks currently adopt.]

MILLER (J.). Soviet Russia. An introduction. London: Hutchinson, 1955. 7½". Pp. 185. 8*s*. 6*d*.

[This book is not primarily intended for economists, but it contains much valuable information on the Soviet economy. Mr. Miller has made good use of his wide knowledge of Russian history and institutions and the unusual opportunities he has enjoyed of studying the working of the Soviet system at first hand. His style is informal and discursive—sometimes, perhaps, excessively so—and his ideas are stimulating. The treatment of economic, social and political factors is closely interwoven throughout.]

MORGAN (E. V.). A First Approach to Economics. London: Pitman, 1955. 9″. Pp. 456. 20*s*.

[To be reviewed.]

MORRIS (S. T.), LUXTON (H. W. B.) and BEYNON (V. H.). Farm Organisation and Incomes in South West England, 1953. Newton Abbot: Department of Agricultural Economics, University of Bristol, 1955. 9″. Pp. 91. 5*s*.

[This bulletin is the sixth in a series of reports on the Farm Management Survey for the South-west. It describes the natural and economic environments of farming in a sample of farms for the 1953 crop year. A general chapter is included on the ways in which data of this kind can be used to assess the performance of individual farms.]

MUSSON (A. E.). The Congress of 1868. The origins and establishment of the Trades Union Congress. London: Trades Union Congress, 1955. 8½″. Pp. 48. 2*s*.

[This is the first detailed study that has been made of the origins of the Trades Union Congress. Mr. Musson provides much interesting information, without altering in general outline the conclusions reached in the Webbs' brief treatment of the subject in their *History of Trade Unionism*. The idea of a Trades Union Congress originated with the Manchester and Salford Trades Council, and it was at first received with suspicion by the leaders of the trade-union world in London—the Junta—as a possible rival to their own authority. The first Congress took place in 1868, but it was not until sectional differences were overcome by the need to resist the Trade Union Bill of 1871 that the Junta gave sufficient support to the Congress to make it a truly representative assembly. One of Mr. Musson's most interesting findings is that both the name of the Congress and the original notion of the form it should take probably derived from the annual meetings of the Social Science Association and of the British Association for the Advancement of Science. It was dissatisfaction at the omission from the Social Science Association's published *Transactions* of an address given by a trade-union spokesman at the Association's Ninth Congress that originally suggested the idea of a Trades Union Congress to one of the officials of the Manchester and Salford Trades Council. If trade unions could not get a fair hearing from middle-class organisations like the Social Science Association, he remarked, "why not have a congress of our own?"]

PAGE ARNOT (R.). A History of the Scottish Miners, from the earliest times. London: Allen & Unwin, 1955. 9½″. Pp. v + 445. 30*s*.

[To be reviewed.]

ROSS (J. F. S.). Elections and Electors. Studies in democratic representation. London: Eyre & Spottiswoode, 1955. 9″. Pp. 480. 42*s*.

[To be reviewed.]

SILBERSTON (A.). Education and Training for Industrial Management. A critical survey. London: Management Publications, 1955. 9″. Pp. v + 101. 12*s*. 6*d*.

[To be reviewed.]

THISTLETHWAITE (F.). The Great Experiment. An introduction to the history of the American People. London: Cambridge University Press, 1955. 9″. Pp. ix + 335. 25*s*.

[To be reviewed.]

Transport. London: Unilever Limited, 1955. 8½″. Pp. 15.

[The subject of the address delivered at the 1955 Annual General Meetings of Unilever Limited and Unilever N.V. was the transport of finished products. The Chairman describes how methods of transport, handling and distribution adopted within the Unilever group vary according to the product and according to the conditions prevailing in different countries. The speaker concludes by discussing why it is that, despite important recent advances, "the world of transport, which should be one of mobility, is to a certain extent characterised by a rigidity of outlook and policy."]

Indian

AROKIASAMY (M.). A Textbook of Indian Economic History. Tiruchirapalli: published by the author at St. Joseph's College, Tiruchirapalli, 1954. 7½″. Pp. 436. Rs. 4/12.

[This volume, designed as an elementary text-book of Indian economic history, takes the various industries and activities of India and studies their development, mainly during the present century. The chief emphasis is on legislation and administrative changes. While a useful source of detailed information, it is less successful in presenting a broad and coherent picture of Indian economic development as a whole and its effects on the standards of life of the people.]

BALAKRISHNA (R.). Studies in Indian Economic Problems. Selected Essays. Madras: published by the author at the University of Madras, 1954. 9″. Pp. 463. Rs. 17/8.

[This volume contains essays published during the past ten years in a variety of Journals, some of them academic, some financial and some of a more political and popular character. They cover topics which for publication have been grouped under the general heads of Finance, Trade and Tariffs, Industry and Labour, Economic Planning, International Economics and Economic Policy. A number of the essays have obviously dated. But a proportion are of a more permanent character. The latter include papers on tax incentives in India, on the role of tariffs in economic expansion and on the limitations of deductive theories of economic location.]

MEHTA (M. M.). Measurement of Industrial Productivity. Calcutta: The World Press, 1955. 9″. Pp. 98. 10*s*. 6*d*.

[This book examines some of the conceptual and statistical problems of the measurement of input, of output and of productivity.]

American

BARATZ (M. S.). The Union and the Coal Industry. New Haven, Connecticut: Yale University Press (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 170. 30*s*.

[The author sees the underlying policy of the United Mine Workers—John L. Lewis' union—as essentially a response to problems of depression. Not merely did the bituminous coal industry suffer along with the rest of the American economy in the 1930s, but the demand for its product has been subject to long-term pressure because of economies in fuel use and the competition of other fuels. In consequence there has been little upward trend in output over the last thirty years. Despite this, wages have risen by more than in most other industries. The union has been determined to prevent a recurrence of the inter-regional price- and wage-cutting which the highly competitive structure of the industry brought about in the past. It has accordingly taken upon itself the task of restricting output to the extent needed to keep prices and wages up. A long-run contraction of employment is one of the chief aims of its strategy. After analysing the effect of the union's policy on wages, technique, the structure of the industry and the allocation of productive resources generally, Mr. Baratz can find no clear case either for or against the union's policies on the grounds of their economic effects. He maintains, however, that economic considerations are not the only ones that should govern public policy towards unionism in this industry or in industry as a whole.]

BARKER (C. A.). Henry George. New York and London: Oxford University Press, 1955. 9½″. Pp. vii + 696. 57*s*. 6*d*.

[To be reviewed.]

BECKWITH (B. P.). Marginal-cost Price-output Control. A critical history and restatement of the theory. New York: Columbia University Press (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 283. 45*s*.

[To be reviewed.]

A Bibliography on South American Economic Affairs. Articles in nineteenth-century periodicals. Compiled by T. B. JONES, E. A. WARBURTON and A. KINGSLEY. Minneapolis: University of Minnesota Press (London: Geoffrey Cumberlege), 1955. 11″. Pp. 146. 44*s*.

[A classified bibliography of over 6,000 distinct items. The authors have methodically worked through the files of several hundred periodicals—all those available that were known to contain relevant material. It was originally intended that the work should cover the whole of Latin America, but the bulk of the material made division essential, and the present bibliography covers South America only.]

BOULDING (K. E.). Economic Analysis. Third, Revised Edition. New York: Harper & Brothers (London: Hamish Hamilton), 1955. 9½″. Pp. xv + 905. 35*s*.

[Since its first appearance in 1941, Professor Boulding's text-book has always had a strong claim to be considered one of the two or three best general-purpose American-style text-books. The concentration on analysis means that a much smaller proportion than is usual in American text-books is confined in usefulness to the American reader. Parts of the book are not exactly elementary, and if this may sometimes discourage the beginner, there is the advantage that the student who acquires it in his first year will continue to find himself referring to it at intervals until his final examination. The greatest alteration in the present edition is the section on macro-economics, which has been completely rewritten and now covers the field very comprehensively.]

BOWEN (H. R.). The Business Enterprise as a Subject for Research. Social Science Research Council, Pamphlet No. 11, prepared for the Committee on Business Enterprise Research. New York: Social Science Research Council, 1955. 9″. Pp. 103. $1.25.

[The author writes: "The purpose of this report is to delineate the field of research on the business enterprise, to provide a general view of past and projected research in this field, and to offer recommendations for its future advancement." He starts by examining the way in which research on the business enterprise provides a point of convergence of economics, social psychology and other disciplines. He then sets forth a general framework within which aspects of the theory of the firm can be classified, and in the final chapter enumerates research topics in more detail within this framework. A bibliography is appended, listing and classifying upwards of four hundred relevant books and articles.]

Business Concentration and Price Policy. A Conference of the Universities-National Bureau Committee for Economic Research. Princeton, New Jersey: Princeton University Press for the National Bureau for Economic Research (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 511. 72*s*.

[To be reviewed.]

DIESSLIN (H. G.). Agricultural Equipment Financing. National Bureau of Economic Research, Occasional Paper 50. New York: National Bureau of Economic Research, 1955. 9″. Pp. 91. $1.25.

[This is part of the Agricultural Finance Project of the National Bureau's Financial Research Program. It describes the history and present situation in the United States with regard to types of facilities available for farm equipment financing, the relative importance of different credit agencies, the terms on which credits are granted and experience of losses. As recently as twenty years ago a substantial part of the financing of farm-equipment sales at the retail level was done by manufacturers, but now this function has been practically wholly taken over by other agencies.]

EDDISON (J. C.). A Case Study in Industrial Development—the Growth of the Indian Pulp and Paper Industry. Cambridge, Mass.: Center for International Studies, Massachusetts Institute of Technology, 1955. 11″. Pp. 337.

[The author describes in some detail the structure and organisation of the industry, its technology, and the present and likely future state of demand for its products. The industry is one in which the economies of scale are pronounced, and problems of management consequently assume especial importance. Much of Dr. Eddison's space is therefore taken up with discussion of entrepreneurship and in particular with discussion of the managing agency system, under which most of the Indian paper industry is organised.]

FABRICANT (S.). Government in Economic Life. National Bureau of Economic Research, Thirty-fifth Annual Report. New York: National Bureau of Economic Research, 1955. 11″. Pp. 78.

[This year's report of the National Bureau appears in a new double-column format. This enlargement makes it possible to give an account of the Bureau's activities that is a model of fullness and clarity. The descriptions of the many research projects in hand or recently completed do more than indicate the topics under study: they contain also provisional statements of findings, and include numbers of tables and charts. Dr. Fabricant's introductory essay discusses various aspects of government participation in economic life in the United States and elsewhere as they appear in the light of some of the National Bureau's recent work.]

GALENSON (W.). Labor Productivity in Soviet and American Industry. A research study by the RAND Corporation. New York: Columbia University Press (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 273. 45*s*.

[To be reviewed.]

GORTER (W.). United States Merchant Marine Policies: some international economic implications. Essays in International Finance, No. 23. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 16.

[The author describes the various forms of protection that American shipping enjoys against foreign competition. His view is that "from a purely economic standpoint, all the policies considered together are to be condemned but some deserve more condemnation than others." This is partly because the shipping conference system in any case restricts some forms of competition between the merchant fleets of different countries. Professor Gorter considers that one of the most effective and therefore harmful forms of restriction is the so-called cargo preference system under which not less than half of goods shipped on account of the United States Government or financed by it must be carried in American-flag vessels.]

GRAYSON (H.). The Crisis of the Middle Class. New York: Rinehart, 1955. 8½". Pp. ix + 172. $2.75.

[The author uses the term middle class in a peculiar sense to include anyone, whatever his present social or economic status, who directs his energies towards the improvement of his individual status within society. Ambitious people of this class are in his view responsible for most economic and social advance. The author traces the part played by this class in different countries and epochs within the framework of a general historicist theory that he expounds. According to this theory a wide range of social conditions have to be fulfilled if the leavening activities of the middle class are to be properly realised. The crisis referred to in the title is the danger that social development in the United States and elsewhere may for various reasons take a retrograde form. Most prominent among these reasons is the increasing power enjoyed by persons and groups in an entrenched position of privilege.]

HOLTZMAN (F. D.). Soviet Taxation. The fiscal and monetary problems of a planned economy. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. 8½". Pp. xvii + 376. 52*s*.

[To be reviewed.]

KRAUSE (W.). The International Economy. New York: Houghton Mifflin (London: Constable), 1955. 9½". Pp. 434. 30*s*.

[This is designed as a text-book for students taking courses in international economics in American universities. With the needs of these students in mind, the author has deliberately emphasised " problems and policies " rather than theory. Indeed, a comparatively small part of the book is devoted to pure theory, and the consequent lack of rigour is inevitably reflected at some points in the treatment of practical problems. The historical background material is also brief and confined chiefly to very recent times. The author's expository style is clear and the price of the book is reasonable, but its usefulness to the British student is probably rather limited.]

LEFTWICH (R. H.). The Price System and Resource Allocation. New York; Rinehart, 1955. 8½". Pp. 372. $4.50.

[To be reviewed.]

LOMBARD (G. F. F.). Behavior in a Selling Group. A case study of interpersonal relations in a department store. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey Bros. & Swinfen), 1955. 8½". Pp. ix + 359. 32*s*.

[This is a study of the behaviour of salesgirls selling children's clothes in a department store in an eastern city in the United States. The fieldwork for it was done in 1940. The author analyses how the interaction between the aims and values of the salesgirls and those of their supervisors led to the establishment of norms of behaviour and affected the well-being of the salesgirls and their efficiency in selling.]

MCNAIR (M. P.). Operating Results of Department and Specialty Stores in 1954. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey Bros. & Swinfen), 1955. 11". Pp. 66. 32*s*.

[This is the thirty-fifth report in the annual series published by the Harvard Business School. In arrangement and contents it closely resembles last year's issue. Despite the general recession, the operating results of department stores in 1954 were very similar to those of 1953. In recent years department stores have been accounting for a slightly diminishing proportion of retail sales, largely because of the switch of expenditure away from apparel towards cars and household goods. In 1954 this trend was reversed, and department stores increased their share of total retail sales. A feature of the year was that the larger stores enjoyed notably better results than the smaller ones].

MARCUS (E.). Canada and the International Business Cycle 1927–1939. New York: Bookman Associates, 1954. 9". Pp. 211. $3.75.

[This book, " a case-study in the international transmission of the business cycle," traces cyclical and secular changes in the Canadian economy in great detail but without the use of sophisticated methods. The author stresses the relative independence of Canadian developments, in the sense that they can only be explained by special factors affecting particular markets. The argument for independence is a trifle Humpty-Dumptyish, but the concentration on major staples as against trade aggregates is commendable as is the attention paid to factors influencing the capital account. An interesting feature of Canadian experience was the relative absence of balance-of-payments difficulties, due to the high import-content of investment and the close linking of Canadian and American securities markets.]

Partnership for Freedom. Proposals for world economic growth. Washington, D.C.: Union for Democratic Action (1341 Connecticut Avenue, N.W.), 1955. 9″. Pp. 52. 25c.

[A discussion of the contribution that the United States can and should make to assist the economic and social advancement of backward countries—an aim which the authors believe to be of the utmost importance in preventing the further spread of Communist power.]

Samuelson (P. A.). Economics, an introductory analysis. New third edition. New York and London: McGraw Hill, 1955. 9½″. Pp. 753. 41*s*.

[Professor Samuelson does not allow his text-book to rest on its laurels. The second substantial revision incorporates numerous alterations in emphasis, detail and arrangement, as well as new chapters on the economics of war and on development. The stress has been shifted somewhat away from the problems of inflation that received special attention in the second issue, and instead repeated insistence is now placed on what the author calls a "grand neoclassical synthesis": "Solving the vital problems of monetary and fiscal policy by the tools of income analysis will *validate* and bring back into relevance the classical verities." The inclusion of the Marshallian time-period analysis in the section on value and distribution brings the treatment there more into line with what is usual in elementary courses in this country. The new material is presented with all the author's energetic clarity. More pronounced than ever is the jauntiness of style, which endears the author to some of his readers and has the opposite effect on others. Additional insight into economic theory as well as into the personality of the author is furnished by the quotations that now adorn the chapter headings.]

Tarshis (L.). Introduction to International Trade and Finance. New York: John Wiley (London: Chapman & Hall), 1955. 9″. Pp. v + 536. 48*s*.

[To be reviewed.]

Trued (M. N.) and Mikesell (R. F.). Postwar Bilateral Payments Agreements. Princeton Studies in International Finance, No. 4. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 92.

[The authors describe and classify the major provisions and types of agreements, particularly with regard to the currency and credit arrangements and the means of settling excess balances. The West German experience is taken as a case study for more intensive treatment. They arrive at some interesting conclusions on the purposes which these agreements have served and the extent to which their provisions have been carried out in practice. In most cases, the target trade levels set in the agreements have not been reached, often because of the high prices of one country's exports, and the arrangements for settlement and credit have frequently had to be made less strict. The authors find it difficult to distinguish between commercial policy and balance-of-payments considerations in seeking the reasons for which bilateral agreements have been concluded, the two being closely connected. Bilateral agreements have often been a means of implicitly devaluing a currency or altering prices, and countries have often used a strong bargaining position in one commodity in order to buy or sell on better terms other commodities in which their bargaining position was weaker.]

Wolf (C.) and Sufrin (S. C.). Capital Formation and Foreign Investment in Underdeveloped Areas. An analysis of research needs and program possibilities prepared from a study supported by the Ford Foundation. Syracuse, New York: Syracuse University Press, 1955. 9½″. Pp. 134. $3.00.

[This report consists of two main parts. The first is a continuous text enumerating the chief problems in the field and describing the lines of approach to them adopted in current research. The problems are discussed under three headings: entrepreneurship and the demand for capital; technological alternatives and the optimum use of capital; and foreign investment and capital formation. This part of the report is interesting to read and provides a valuable guide and summary of ideas advanced in recent literature (chiefly American literature). The authors recognise that capital formation is only one aspect of the problem of economic development, and they make no attempt to survey other parts of the field systematically. A further and more regrettable limitation is that they appear to have decided that the experience of capital formation in Communist countries falls outside their scope. Most of the remainder of the report consists of an annotated bibliography of recent publications, the majority of which appeared between 1949 and 1954.]

German

Paulsen (A.). Neue Wirtschaftslehre. Einführung in die Wirtschaftstheorie von John Maynard Keynes und die Wirtschaftspolitik der Vollbeschäftigung. 3, neugefasste und erweiterte Auflage. Berlin: Franz Vahlen, 1954. 8½″. Pp. 387. DM. 18.80.

[This is the third edition of Professor Paulsen's introduction to Keynesian economics.]

SÖZERI (S.). Der Wirtschaftsaufbau der Türkei nach dem Zweiten Weltkrieg. Kiel: Institut für Weltwirtschaft an der Universität Kiel, 1955. 9½". Pp. 128. DM. 10.

[This concise account of the recent economic history of Turkey shows how the process of industrialisation has passed from state to private initiative. In the post-war period Turkey has considerably expanded its exports of cereals and cotton, and so has been able to pay for its imports of capital goods. This study suggests, however, that there is still considerable scope for foreign capital.]

Italian

BRESCIANI-TURRONI (C.). Corso di Economia Politica. Vol. I. Teoria generale dei fatti economici. Milan: Guiffrè, 1953. 10". Pp. 434. Lire 2000.

[In this second edition the author has added some sections on statistical methods in economics and a fuller treatment of the Pareto curve in the theory of income distribution, as well as making a number of detailed improvements and additions.]

COSCIANI (C.). Principii di Scienza delle Finanze. Turin: Unione Tipografico-Editrice Torinese, 1953. 10". Pp. 587. Lire 3000.

[This is a comprehensive text-book on the theory of public finance. In the course of the work the author covers a wide range of more general economic theory.]

Teoria e Politica dello Sviluppo Economico. A symposium, with an introduction by G. U. PAPI. Milan: Antonino Giuffre, 1954. 10". Pp. 567. Lire 3000.

[This volume is the result of a series of meetings held in the Istituto di Economia e Finanza della Facoltà Giuridica Romana. It contains seventeen papers by Italian economists on problems of economic development. Each paper is accompanied by a summary in English.]

Swiss

HEUSS (E.). Wirtschaftssysteme und internationaler Handel. Zürich and St. Gallen: Polygraphischer, 1955. 9½". Pp. 224. Fr. 21.85.

[This exposition of the pure theory of international trade concentrates on the influence of "market organisation"; about a half of the book is devoted to international trade under conditions of monopoly and socialism as compared with competitive conditions. The treatment is rigorous, but the more mathematical parts have been conveniently segregated into appendices.]

STAUB (H. U.). Reden schweizerischer und britischer Bankpräsidenten 1927–1950. Zürich: University of Zürich, 1955. 9". Pp. 215.

[In this dissertation Dr. Staub has compared the speeches of the chairmen and presidents of the main banks in Switzerland and the United Kingdom. The result is a not uninteresting account of events in the period 1927–50 as seen from the world of high finance.]

Swedish

HANSEN (B.). Finanspolitikens Ekonomiska Teori. Penningvärdeundersökingen: Del II. Statens Offentliga Utredningar 1955: 25. Uppsala: Almqvist & Wiksell, 1955. 9½". Pp. 403.

[To be reviewed.]

Dutch

DREES (W.). On the Level of Government Expenditure in the Netherlands after the War. Aspecten der Economische Politiek, No. III. Leiden: Stenfert Kroese, 1955. 9". Pp. 135. f. 10.50.

[In the Netherlands as elsewhere, concern has been felt in recent years at the high level of government expenditure. Total government expenditure in the Netherlands (three-quarters of which is expenditure by the central government) comprises about one-third of the national income. The question to which Dr. Drees addresses himself is whether the level of this expenditure is as irreducible as is often made out. His answer, broadly, is in the negative. His essay is in three parts. The first analyses the chief headings of expenditure, and considers amongst other things the effects on government spending of a rising price-level. In so far as a rise in the price-level is caused by inflation in the outside world, the author argues (as Professor Hawtrey and others have done in this country) that there is a case for neutralising it by appreciating the currency. The second part of the essay describes budgetary procedures in the Netherlands and concludes that

weaknesses in co-ordination have tended to bring about " a struggle for high expenditure." Representatives of different departments and interests all press for high expenditure in their own spheres and do not oppose the claims of the others. In the final part Dr. Drees sets forth two alternative programmes for central government expenditure in 1960, one assuming continuation of present trends, the other involving certain moderate economies. The difference between the two amounts to some 4% of the projected national income.]

KLEIN (L. R.) and GOLDBERGER (A. S.). An Econometric Model of the United States, 1929–1952. Contributions to Economic Analysis, IX. Amsterdam: North Holland Publishing Company, 1955. 9″. Pp. 165.

[To be reviewed.]

Greek

METAXAS (B. N.). Political and Social Struggles during the Persian and Peloponnesian Wars. Athens: Archives of Economic and Social Sciences, 1955. 10″. Pp. 82.

[This contains a fairly detailed account of the part played by party conflict (stasis) in the domestic and external policies of the various city states of Greece up to the end of the fifth century B.C. The author develops his narrative with the aid of extensive quotations from the standard classical authors, especially Thucydides, who is his main source. While not especially original, the essay is lucid and well arranged.]

Egyptian

HAYEK (F. A.). The Political Ideal of the Rule of Law. National Bank of Egypt Fiftieth Anniversary Commemoration Lectures. Cairo: National Bank of Egypt, 1955. 10″. Pp. 60.

[In these lectures Professor Hayek returns to the legal studies in which he started his career. With a wealth of learning he traces the origins of the idea of the Rule of Law and its evolution in the last two centuries. Its decline in modern times he regards as one of the chief causes of our present discontents. To Professor Hayek the Rule of Law means rather more than that laws should apply impartially to all individuals and that their application should be controlled by the courts rather than by administrative discretion. It includes also the doctrine that certain individual rights, including the right to own property, are basic and may not be infringed except in a real emergency, like a war, and then only with compensation. He recognises that equality before the law is inconsistent with the attainment of equality in a more general sense, since it prevents the State from acting to redress existing inequalities. He does not shrink from this conclusion. The last lecture is devoted to discussion of the attack on the Rule of Law conducted by lawyers of Harold Laski's school. Here the author is content to show the potentially far-reaching implications of this attack, without debating its underlying assumptions. From the lines that Professor Hayek's argument follows, it would appear that the limitations on state power implied by the Rule of Law depend for their justification on value judgments about the sanctity of property and the unobjectionableness of inequality in relation to the paramount need to avoid the exercise of arbitrary power. Professor Hayek also places reliance on competition to prevent arbitrary coercion by private individuals or groups endowed with economic power, once the State has been duly shackled.]

Official

BRITISH

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. Domestic Food Consumption and Expenditure, 1953. Annual Report of the National Food Survey Committee. London: H.M. Stationery Office, 1955. 9½″. Pp. 104. 4*s*.

[The general scope and arrangement of this report is similar to that of the report for 1952 (noticed in the ECONOMIC JOURNAL, March 1955, p. 193). 1953 is found to have been a year in which the improvement in food supplies led to a reversion towards the pre-war pattern of diet, with an increased proportion of expenditure devoted to meat, eggs, butter, sugar and tea. New features of this year's report include a section on food consumption and expenditure in Scotland and a section on differences between urban and rural diets.]

HICKS (J. R. and U. K.). Report on Finance and Taxation in Jamaica. Kingston, Jamaica: The Government Printer; London: Crown Agents for Overseas Governments and Administrations (4 Millbank, S.W.1), 1955. 8½″. Pp. 171. 3*s*.

[To be reviewed.]

ROYAL COMMISSION ON THE TAXATION OF PROFITS AND INCOME. Final Report. London: H.M. Stationery Office, 1955. 9½″. Pp. 487. 12*s*. 6*d*.

[To be reviewed.]

WRIGHT (F. C.). African Consumers in Nyasaland and Tanganyika. An enquiry into the Distribution and Consumption of Commodities among Africans carried out in 1952–1953. Colonial Research Studies, No. 71. London: H.M. Stationery Office for the Colonial Office, 1955. 9½". Pp. 117. 12*s.* 6*d.*

[This inquiry was prompted by the commonly held opinion that the incentive to Africans in Nyasaland and Tanganyika to acquire cash income is impaired because too narrow a range of goods is offered for sale to them through the present system of distribution. Dr. Wright's interesting report does not give much support to this thesis. While not denying that the range of goods on sale is fairly narrow, he finds that, with a few exceptions, most of the commodities that traders have been criticised for not supplying would be in little demand. Severe limitations are imposed by the general pattern of tribal life as well as by the low level of cash incomes. Dr. Wright also provides much useful information and many shrewd judgments about distribution generally in the territories and about the effects of the government regulation it is subject to. The readability of his report suffers a little from its unduly Latinised vocabulary and syntax.]

AUSTRALIAN

BUTLIN (S. J.). War Economy, 1939–1942. Australia in the War of 1939–1945, Civil Series, Volume IV. Canberra: Australian War Memorial (London: Angus & Robertson), 1955. 9½". Pp. xi + 516. 25*s.*

[To be reviewed.]

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning an Alleged Combine in the Manufacture, Distribution and Sale of Beer in Canada. Ottawa: Department of Justice, 1955. 9½". Pp. 104.

[The situation dealt with in this report has arisen from a long series of acquisitions of other brewing companies by Canadian Breweries Ltd. and its subsidiaries. Many of these acquisitions were followed by the closing down of the plants acquired. Till 1943 the activities of Canadian Breweries Ltd. were confined to Ontario, but since then they have begun to extend to other provinces. The Commission find that the Company has not so far succeeded in gaining complete or substantial control of the industry, even in Ontario. They hold, however, that control might well be established if the company continues to expand in the way it has been doing. They therefore recommend that further acquisitions of competing breweries by the company should be prevented.]

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report on an Inquiry into Loss-leader Selling. Ottawa: Department of Justice, 1955. 9½". Pp. v + 278.

[The scope of this report makes it of more general interest than most of the publications of the Canadian Restrictive Trade Practices Commission. The word loss-leader was found by the Commission to be very loosely used, and a good many of the business representatives who complained about it seemed to think of it in the terms made explicit by one of their number: "If you sell below the manufacturer's suggested price, I think you could very well say you are cut-pricing or loss-leadering." If a loss-leader is defined as a sale of an article at a price below its cost to the retailer, the practice is not at all a usual one (apart from such recognised exceptions as sales of discontinued lines or bankrupt stocks). But this definition is rather arbitrary, and there is more evidence that some retailers are accustomed to sell certain lines at an unusually low profit margin. The Commission hold, however, that this should be regarded as a form of advertisement not fundamentally different in its competitive effect from other types of advertisements, though more beneficial to the customer. There is no ground for believing that it is specially connected with attempts to establish a monopoly, and it is, incidentally, by no means confined to branded goods. Although the recent prohibition of resale price maintenance in Canada has no doubt had some influence on the situation, the Commission maintain that the difficulties recently experienced in some branches of retail trade are not due primarily to the selling of individual articles at very low prices: they are due rather to keener all-round competition and lower costs, associated in some instances with partial saturation of the market. Accordingly, they do not find any reason to recommend legislation against loss-leaders.]

AMERICAN

UNITED STATES DEPARTMENT OF COMMERCE. National Income, 1954 Edition. A supplement to the Survey of Current Business. Washington, D.C.: Office of Business Economics, Department of Commerce, 1954. 11½". Pp. 249. $1.50.

[This replaces the 1951 edition as the official compendium of United States national-income statistics. The data have been revised and a number of new tables added. The statistical section is preceded by 158 pages of text. Part I reviews trends and fluctuations in national income and output since 1929. Parts II to IV contain an extremely useful detailed account of the conceptual framework of national-income statistics and of the sources and methods used to arrive at them.]

INTERNATIONAL

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT. The Economic Development of Syria. Report of a Mission organised by the Bank at the request of the Government of Syria. Baltimore, Maryland: Johns Hopkins Press for the International Bank for Reconstruction and Development (London: Geoffrey Cumberlege), 1955. 9½". Pp. 486. 60*s*.

[Like other recent reports of International Bank Missions, this contains a comprehensive survey of the economy of the country as well as detailed policy recommendations. Syria has experienced remarkable economic expansion in the last two decades, despite its relative lack of resources other than land (no oil has so far been discovered). It is not over-populated by the standards of other Asian countries, and the availability of idle land has made possible a doubling of the area under cultivation since before the war. There has also been very rapid industrial growth, and the real national income is reckoned to be nearly twice pre-war. Domestically financed capital formation has been at a surprisingly high level in relation to income. So far the government has contributed relatively little to this growth, and even irrigation schemes have been carried out chiefly by private enterprise. Satisfactory as the recent record is in many respects, the Mission suggests that the time has now come for the Government to take a more active part. This applies particularly in agriculture, since there is now much less idle land available for cultivation without prior investment. The irrigation schemes needed at present are beyond the means of private enterprise. The Report also puts forward proposals for a number of other important measures by which the Government could help to raise production in agriculture and other sectors of the Syrian economy. The whole programme would involve annual government expenditure in the region of $100 million between now and 1960. It is suggested that about a tenth of this might be raised by borrowing abroad.]

INTERNATIONAL MONETARY FUND. Sixth Annual Report on Exchange Restrictions, 1955. Washington: International Monetary Fund, 1955. 9½". Pp. 391.

[The bulk of this report consists of detailed descriptions of the restrictions in force in different countries. A brief introductory section reviews in more general terms the progress made in 1954 towards the relaxation of restrictions.]

INTERNATIONAL TIN STUDY GROUP. 1955 Statistical Supplement to the Statistical Year Book, 1954. The Hague: International Tin Study Group, 1955. 10½". Pp. 92. 12*s*. 6*d*.

[The International Tin Study Group publishes a *Year Book* and a *Supplement* in alternate years. The present *Supplement* brings up to date (in somewhat less detail) the information given in the 1954 *Year Book*. This issue of the *Year Book* was noticed in the ECONOMIC JOURNAL, March 1955, p. 194.]

UNITED NATIONS. Economic Developments in the Middle East, 1945 to 1954. Supplement to the World Economic Report, 1953–54. New York: United Nations Department of Economic and Social Affairs, 1955. 10½". Pp. 236. 17*s*. 6*d*.

[An introductory chapter surveys the recent development of the region in general terms, and the remainder of the report deals with the chief countries one by one—Egypt, Iran, Iraq, Israel, Lebanon, Syria and Turkey. The great amount of detailed information contained makes the report a useful source of reference.]

UNITED NATIONS. The Quest for Freer Trade. New York: United Nations Department of Economic and Social Affairs, 1955. 9". Pp. 59. 3*s*.

[This contains an examination of the recent history and present state of the various obstacles and restrictions on free international trade that have been imposed in pursuit of national commercial policies or because of balance-of-payments difficulties. The scope of the survey includes tariffs, preferences, export subsidies, international commodity agreements, state trading monopolies, quantitative restrictions and exchange control. An account is also given of attempts such as E.P.U. to solve the payments problem on a regional basis].

UNITED NATIONS. Review of Economic Activity in Africa, 1950 to 1954. Supplement to World Economic Report, 1953–54. New York: United Nations Department of Economic and Social Affairs, 1955. 10½". Pp. 146. 11*s*.

[This well-arranged survey is mostly factual rather than analytical in character. Economic developments in Africa during the five years concerned are described under the headings: production (agricultural, mining and mineral, fuel and power, secondary industries), labour, foreign trade, fiscal developments and investment.]

UNITED NATIONS. Scope and Structure of Money Economies in Tropical Africa. New York: United Nations Department of Economic and Social Affairs, 1955. 10½". Pp. 52. 3*s.* 9*d.*

[This is an analysis of the flow of money income derived from exchange as distinct from subsistence activities in tropical Africa. The national-income estimates that have been prepared for the several countries of the region are drawn upon in order to show the size of the money income flow, its industrial origin, its division between indigenous and non-indigenous enterprises and recipients and between wages, corporate profits and other categories, together with statistics on expenditure on domestic and imported products and on capital formation. The next chapter treats in detail the two major sectors from which money income originates, the export sector and the public sector. The final chapter contains an attempt to summarise the relative orders of magnitude of the chief determinants of income (exports, foreign investment, transfers and "autonomous," *i.e.*, production and exchange within the domestic market) and to outline some of the implications of the results arrived at in relation to prospects of economic development.]

UNITED NATIONS COMMISSION ON INTERNATIONAL COMMODITY TRADE. 1955 Survey of Primary Commodity Markets. New York: United Nations, 1955. 10½". Pp. 122. 12*s.* 6*d.*

[The bulk of this report consists of detailed accounts of the behaviour of individual commodity markets in the course of 1954. All principal commodities are included, with the exception of wheat, sugar, tin and coffee, which were dealt with in another recent United Nations document.]

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. International Bibliography of Economics. Volume I (works published in 1952). Prepared by the Fondation Nationale des Sciences Politiques (Paris) with the assistance of the International Economic Association and the International Committee for Social Science Documentation. Paris: Unesco, 1955. 9½". Pp. 429. 42*s.*

[This is the first instalment of what will be an annual publication if sufficient support is forthcoming. Some seven thousand titles of books and articles published in 1952 are listed, classified and indexed. It is safe to say that this is bibliography on a larger scale than has ever been attempted before in economics, and it is likely to become an important tool of research. The coverage is world wide, and attempts to be fairly comprehensive, though the compilers have, reasonably enough, drawn the line at articles in the daily or weekly Press. (One important omission is the *Bulletin of the London and Cambridge Economic Service*.) The method of classification is easily understood, and with a little practice the reader should be able to find what he wants without too much difficulty. Classification is easiest for contributions to clearly defined fields of empirical study, and a certain amount of hunting may be needed to track down all the items bearing on more general or theoretical topics. There are three indexes, by author, subject and country. The country index is very elaborate, but some important headings are not included in the subject index—*e.g.*, inventories—and this might with advantage be enlarged.]

PITMAN

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